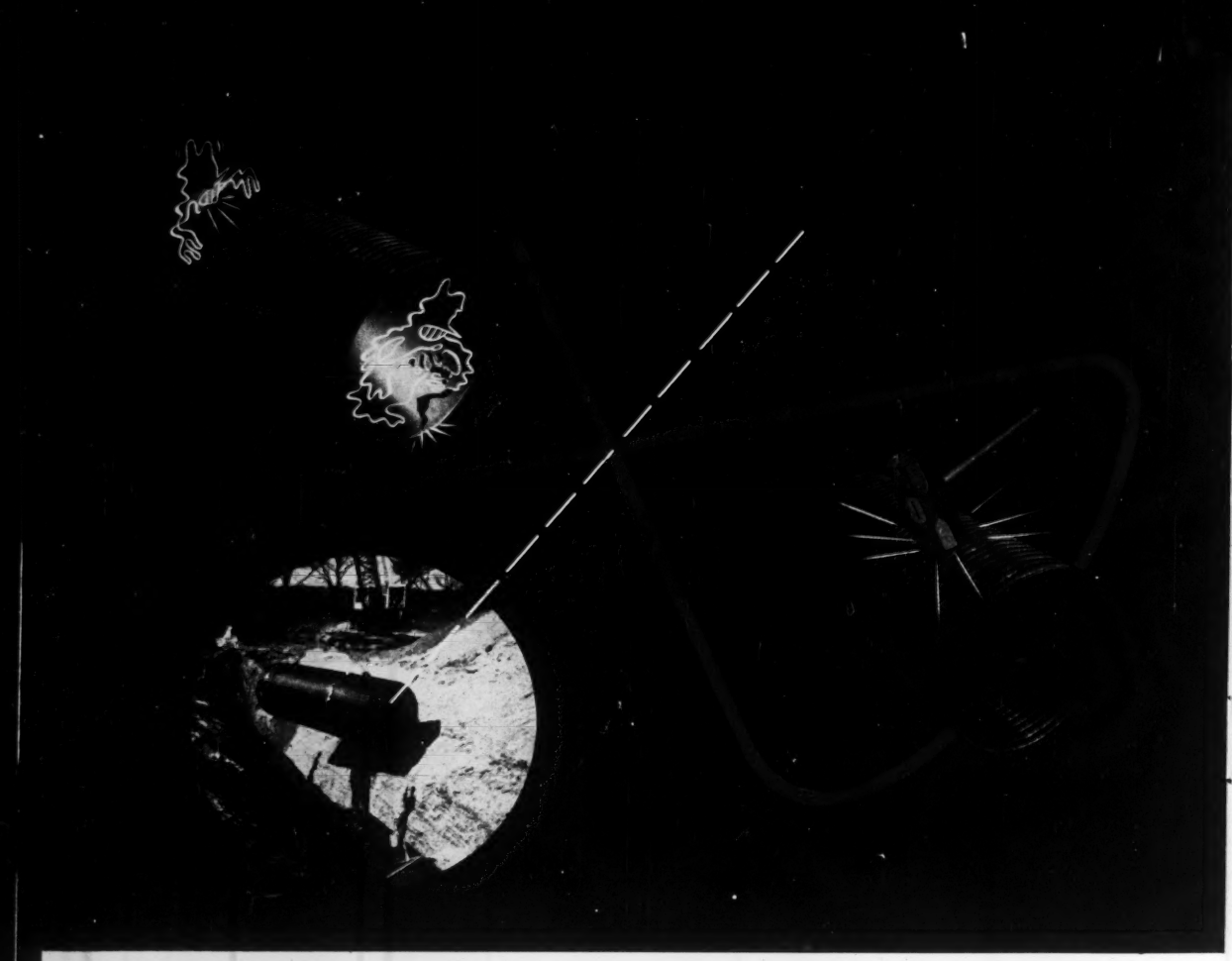
ENGINEERING NEWS-RECORD

A McGRAW-HILL PUBLICATION



Good sewers lead a double life

Experienced sewer designers have long known that every sewer must have *structural integrity* as well as *material durability*. However, materials that withstood severe corrosion were often structurally weak. The result was frequent failure, high maintenance and loss of efficiency.

Then Armco engineers found a perfect answer.

They developed Armco ASBESTOS-BONDED Pipe—a pipe that would take severe corrosion in stride and had all the structural advantages of corrugated metal design.

Millions of rot-proof, non-deteriorating asbestos fibers are inseparably bonded by zinc to the base metal. When thoroughly impregnated with a special saturant and seal coat they assure great resistance to acid, alkaline and saline conditions. Equally important, Armco Pipe has structural strength to withstand the impact and weight of heavy loads, maintains alignment and has strong, tight joints to stop leaks and prevent infiltration of ground water.

Providing better products to meet specific needs has been standard practice at Armco for more than 40 years. A few examples are FLEX-BEAM Guardrail, PIPE-ARCH, Steel Buildings and sturdy MULTI-PLATE Bridges.

Today you can bring your drainage and construction problems to Armco with full assurance you will receive all the benefits of long experience, extensive research facilities, and a real interest in helping you solve these problems.

Armco has a complete range of engineered products and convenient, authoritative data to help you. If your problem is difficult or unusual, why not talk it over with us.

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MIDDLETOWN, OHIO • OFFICES AND PLANTS IN PRINCIPAL CITIES
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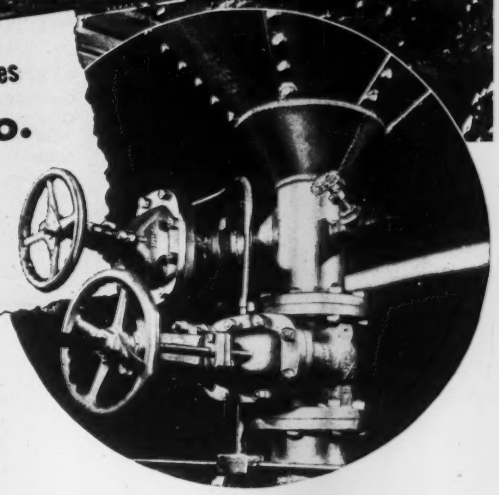
At this 400-acre "Proving Ground" for Valves

A. E. STALEY Mfg. Co.

consults past performance records . . . repeats choice of JENKINS VALVES



If you set out to build an industrial "proving ground" for valves, it could include few tougher tests than those imposed in normal services at this 108-building plant for the manufacture of Staley's Corn and Soy Bean Products at Decatur, Illinois.

Processing heavy syrups and concentrates soon seeks out any weak spots in valve design and construction. The punishing work load on valves imposed by tremendous volumes of fluids handled is indicated by the water requirements alone,—over 20,000,000 gallons a day.

Previous experience with the low-cost performance of Jenkins Valves led to their repeated choice for 30 new buildings constructed as part of Staley's multi-million dollar post-war expansion program.

This confidence in the *extra measure* of efficiency and endurance built into Jenkins Valves is shared by plant operating managements in every type of industry.

Despite this extra value, *you pay no more* for Jenkins Valves. For new installations, for all replacements, let the Jenkins Diamond be your guide to lasting valve economy. Jenkins Bros., 100 Park Ave., New York 17. Jenkins Bros., Ltd., Montreal.

CONTROLLING FLOW from a syrup blending tank (above) requires valves that are "maintenance misers". These are some of the thousands of Jenkins Valves in the Staley plant on water, steam, and processing pipelines, and on compressed air piping serving pneumatic ducts for dry products.

JENKINS VALVES

LOOK FOR THE DIAMOND MARK

SINCE 1864 TRADE JENKINS MARK

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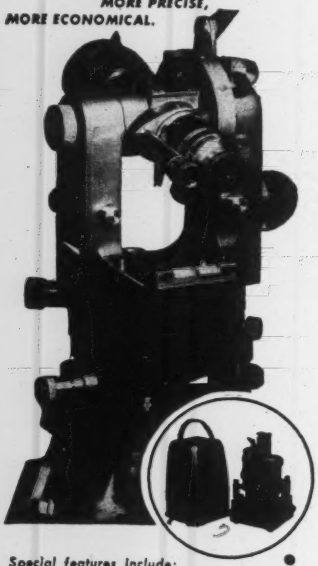
The FILOTECNICA
6" OPTICAL TRANSIT-THEODOLITE

The newest and most modern instrument for surveyors and engineers. Its special innovations combine to make instrument operation
MORE RAPID,
MORE PRECISE,
MORE ECONOMICAL.



Special features include:

OPTICAL PLUMMET—eliminates plumb bob.

OPTICAL READING SYSTEM—vertical and horizontal readings taken at a glance to 6" thru microscope eyepiece next to telescope.

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ENGINEERING NEWS-RECORD

ABP Member ABC

Volume 148 JUNE 19, 1952 No. 25

WALDO G. BOWMAN
Editor

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BROWN & ROOT, INC., Houston, Texas are operating their FORTY-SEVENTH

NORTHWEST 47

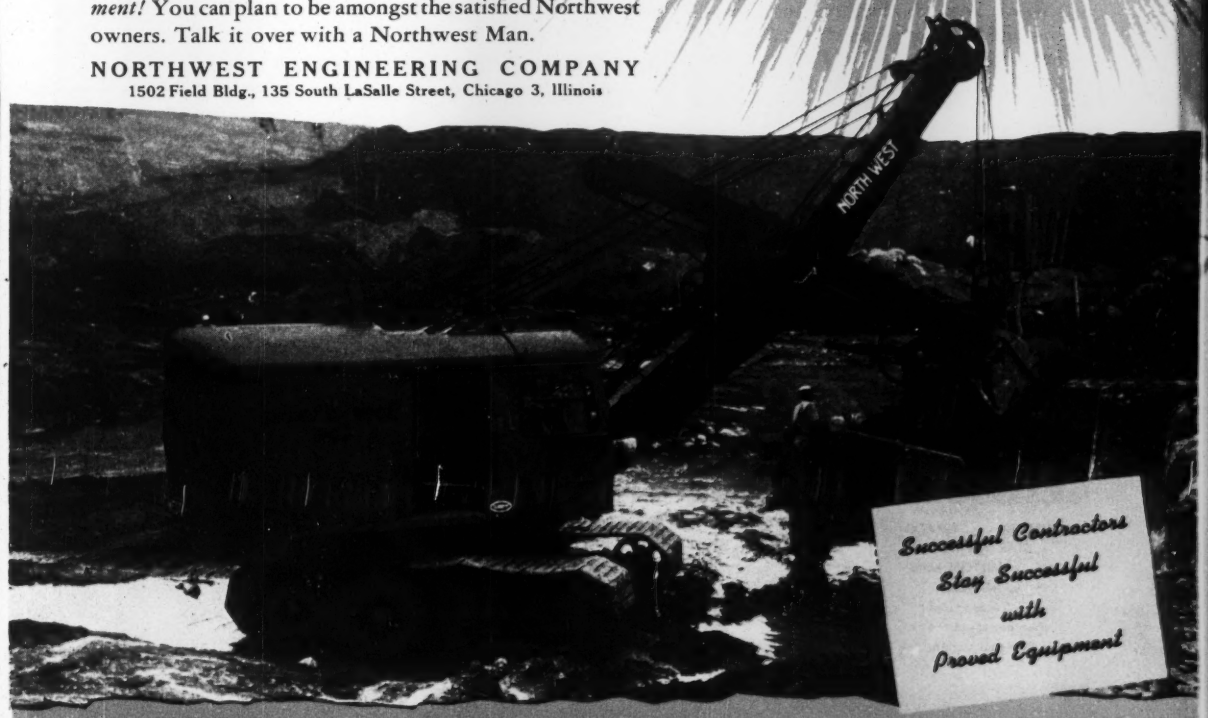
● Advertising can talk superiority but repeat orders prove it! — and there is a lot of proof in forty-seven orders for one make of equipment.

Maybe you have wondered about Northwest Advantages — Northwest Steering, Northwest Uniform Pressure Swing Clutches, the Northwest Cushion Clutch, the Northwest Dual Independent Crowd, Northwest cast steel machinery bases and machinery side frames — and all the other Northwest features. If you are still wondering, take a look at the successful contractors that have bought Northwests year after year, (remember, these people have used other makes of equipment) and ask yourself why do they buy Northwests over and over again?

Successful contractors stay successful with *proved equipment!* You can plan to be amongst the satisfied Northwest owners. Talk it over with a Northwest Man.

NORTHWEST ENGINEERING COMPANY
1502 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

. . . ADVERTISING can talk Superiority — REPEAT ORDERS prove it!

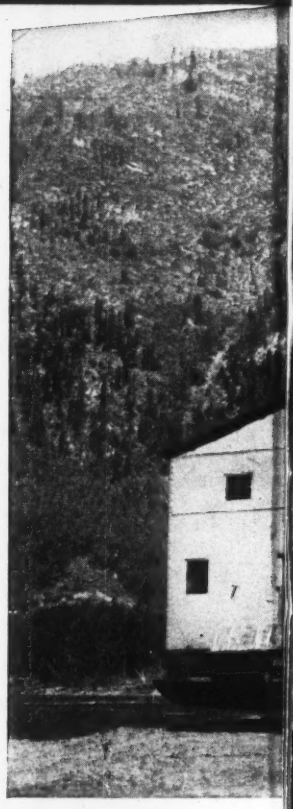


SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

"The time and TEXACO SIMPLIFIED PLAN are incalculable"

—says General-Shea-Morrison Co.

"Not only is it more economical to use a small number of lubricants," says the contractor for Hungry Horse Dam, Montana, "but there is little chance of error in application . . . a big factor in keeping our equipment on the job and our maintenance costs low."



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1. ENGINE LUBRICATION: Use *Texaco Ursa Oil X***. This fully detergent-dispersive oil keeps both heavy-duty gasoline and Diesel engines clean . . . keeps harmful deposits from forming . . . guards against wear, rust and bearing corrosion. Maintenance costs and fuel consumption are both lower.

2. CHASSIS LUBRICATION: Use *Texaco Marfak*. It's tough, longer lasting. Won't jar or squeeze out of bearings, protects against dirt, rust, wear. *More than 400 million pounds of Texaco Marfak have been sold.*

3. WHEEL BEARING LUBRICATION: Use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in — assuring longer bearing life, safer braking. No seasonal change required.

4. CRAWLER TRACK LUBRICATION: Use *Texaco Track Roll Lubricant*. It gives long-lasting protection against dirt, water and wear. Reduces maintenance costs.

5. AIR COMPRESSOR LUBRICATION: Use recommended Texaco air compressor oils. There is one exactly suited to your particular operating conditions.

6. ROCK DRILL LUBRICATION: Use *Texaco Rock Drill Lubricant EP*. It has "extreme pressure" properties that give superior protection against wear. It guards against rust whether drills are running or idle.

Follow the Texaco Simplified Lubrication Plan for greater savings and convenience on every job. A Texaco Lubrication Engineer will gladly help you set it up to meet your particular conditions. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.

TEXACO

TEXACO

confusion saved by the LUBRICATION

Only 6 Texaco Products needed to handle all major lubrication

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Faithfully yours

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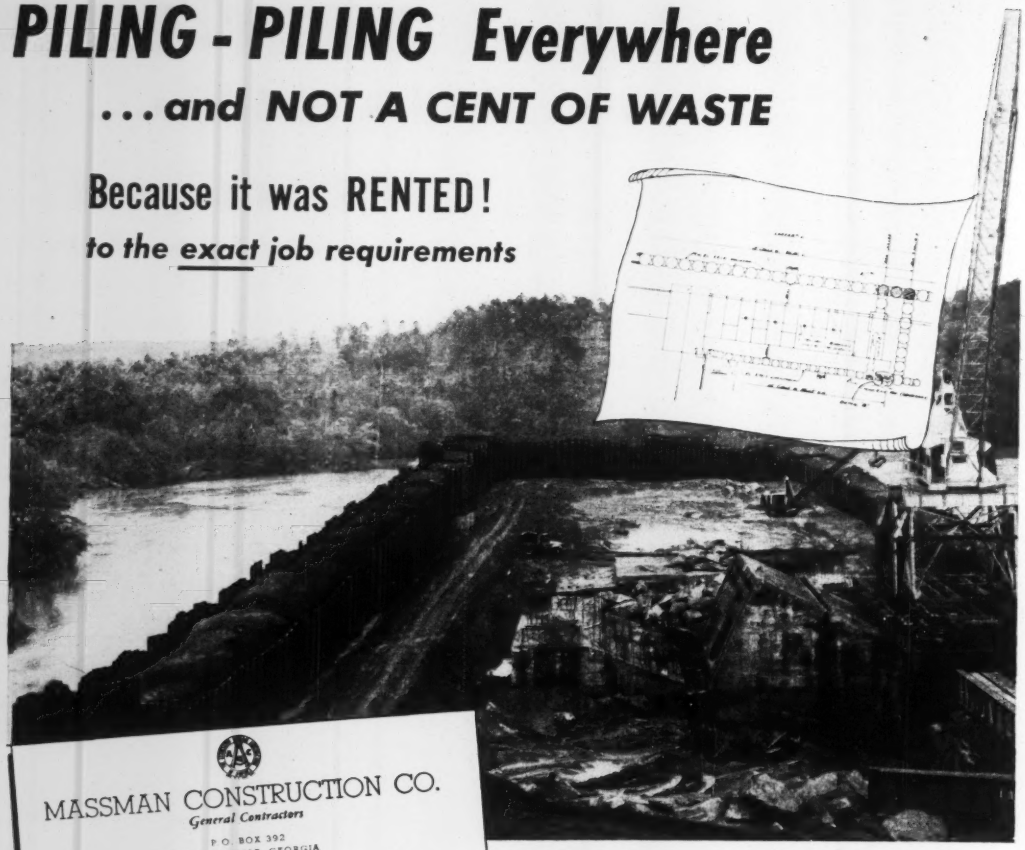
for Fifty Years

PILING - PILING Everywhere

...and NOT A CENT OF WASTE

Because it was RENTED!

to the exact job requirements



MASSMAN CONSTRUCTION CO.
General Contractors
P. O. BOX 392
MILLEDGEVILLE, GEORGIA

To: L. B. Foster Company

Gentlemen:

We had to divert the Oconee River for a spillway section for the Georgia Power Company's new dam and powerhouse. One of our biggest helps was to be able to get -- in a hurry and at no great capital outlay on our part -- ALL THE STEEL SHEET PILING the job required - by renting from Foster. May we say it was a pleasure to be serviced by you.

Very truly yours,

Massman Construction Co.

By: Wm. Pappenheimer
Wm. Pappenheimer
Proj. Mgr.

Interesting Statistics on U-Shaped Cofferdam

Upstream: 800 ft. long, 21 cells, each 30.5 ft. diam. spaced on 36.15 ft. centers. Downstream: 550 ft. long, 20 cells, each 20.38 ft. diam. spaced on 26.47 ft. centers. Distance between two rows of cells—200 ft. Bed of river at elevation 256—Upstream piling driven to 281, downstream to 270. Project will contain 180,000 cu. yards of concrete and 500,000 cu. yards earth fill.

Here was a "big job"—where the contractor prided his "no waste" efficiency. The logical expedient—was to RENT the many and varied sections of piling, no need to use "substitute" lengths—he got the exact requirements for the job, almost on a moment's notice—from FOSTER RENTAL STOCKS.

Let us quote you on our low-cost piling rentals—prompt service from 5 Foster warehouses. Send for free piling brochure illustrating diagrams of all standard-made sections.

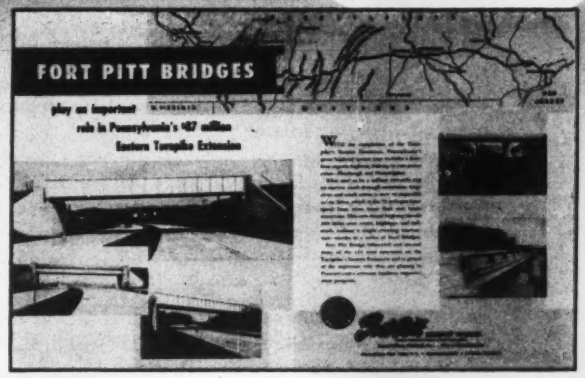
Request Bulletin EP-6

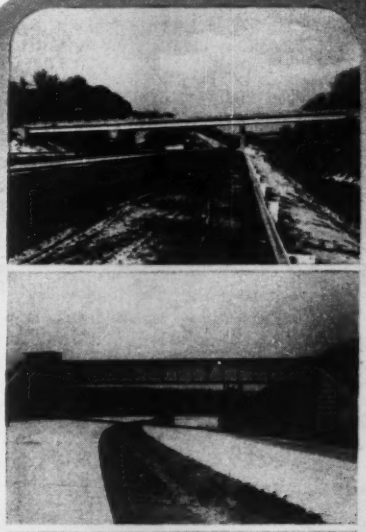
RAILS—TRACK EQUIPMENT • PIPE • WIRE ROPE

L.B.FOSTER CO.

PITTSBURGH 30, PA. • NEW YORK 7, N.Y. • CHICAGO 4, ILL. • HOUSTON 2, TEX.

Pennsylvania's Western Turnpike Extension is served by many FORT PITT Structural Steel Bridges too!





From one end of Pennsylvania's famous Turnpike to the other—Fort Pitt Steel Bridges have played an important role. Steel Bridges, because of their excellent service records, are the logical choice of experienced highway engineers everywhere.

"There's no substitute for Structural Steel"

BRIDGE WORKS

Member American Institute of Steel Construction

General Offices, Pittsburgh, Pa. · Plant at Canonsburg, Pa.

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AISC — American Institute of Steel Construction Inc. — Founded 1921

"Steel Permits Streamlining Construction with Safety, Endurance and Economy"

In the NETHERLANDS

Tournadozer reclaims lowlands

Soil-building methods perfected by generations of "borrowing" land from the sea have recently been adapted for inland reclamation work by the progressive Netherlands firm, Bulldozer - Bedrijf H. J. Meijer of St. Jacobi Parochie. Using the most modern equipment, contractors are placing 1,300,000 cu. yds. of fill over marshy lowlands near Deurne to provide fields for cultivation of wheat, corn, and other crops.

As in coastal reclamation work, the area was first drained, then leveled. Next, white sand was brought in, leveled, and plowed to a depth of 16 in. At present, brown sand and humus sods are being

Tournadozer, Tournapull—Trademark Reg. U. S. Pat. Off. EX97

LETOURNEAU

LET

EQUIPMENT

Operator reports that he can do twice as much work with this Tournadozer as he can with a crawler-tractor of comparable drawbar capacity. Tournadozer is easier to drive, easier to maintain, and far less tiring to operate, he adds.

to increase vital food supply

laid on top of the white sand in unmixed layers 2 to 8 in. deep to assure permanent soil fertility. Meijer is accomplishing all this final precision dirtmoving with bulldozers. After 2 years of operation, he reports that his rubber-tired Tournadozer has been most effective for spreading the material over long 65 to 230 ft. dozing distances. "Fingertip" electric control of the Tournadozer blade gives him accurate spreading depth without mixing the layered earth.

Rolling on 21.00x25, low-pressure tires, the 186 h.p. Tournadozer moves about 2.5 cu. yds. of dirt each "push". It accurately spreads an average of 120 cu. yds. of abrasive sandy soil hourly over typical 165 ft. one-way distances. Despite frequent, heavy rains, which make the material difficult to handle, this consistent rate of production is helping keep the job on schedule.

If you are interested in obtaining similar results on agricultural or industrial work, let your LeTourneau Distributor tell you more about this 19 m.p.h. dozer on rubber. He will also be glad to show you how modern, high-speed Tournapulls, rear-dump and bottom-dump hauling units can assure you of higher output and lower costs. See him for all the facts.

R. G. LeTOURNEAU, INC.
Peoria, Illinois

There's a difference in PERFORMANCE and COST

VS.

TOURNADOZER
Only 4 rubber-tired wheels

1. Free-rolling 19 m.p.h. speeds. Power travels in anti-friction bearings. Instant gear change saves vital dozing momentum.
2. Drives anywhere under its own power. Travels pavement, crosses curbs, tracks without damage.
3. Travels on rubber-tired wheels as simple and maintenance-free as those of your car or truck.
4. Giant low-pressure tires absorb shocks. Machine parts as well as operators ride smoothly over rough, bumpy, uneven surfaces.
5. Tires flex for self-cleaning in gumbo. You have no delays to dig out mud, no power loss.

CRAWLER TRACTOR
500 wearing parts

1. More friction; speeds of only 4 to 8 m.p.h. Slow shift with resulting loss of momentum and slow acceleration.
2. Must be trailer-hauled job to job. Can't cross highways, tracks or curbs without protection.
3. Over 500 wearing parts in track operate constantly in grinding dirt. Need regular replacement.
4. Rigid track assembly means constant jolting and shock load to parts assembly and operator on travel over any kind of surface.
5. Cleats pick up mud, rollers gum up and muck acts as a brake, robbing power.

The Pennsylvania Railroad USES Borden All-Weld Gratings

floor gratings

- best type for use where floors are subject to extreme moisture or corrosion.
- no cracks, open joints, or holes in bars

BORDEN METAL PRODUCTS CO.
ELIZABETH, N. J.
Southern Division — Leeds, Ala.
Main Plant — Union, N. J.

READER COMMENT

THIS PRESTRESSED CONCRETE DESIGN was proposed as an alternative to the Magnel method for the Walnut Lane Bridge in Philadelphia, Pa.

How to cut bridge costs

Sir: The voluminous flow of letters from your readers concerning the cost of prestressed concrete bridges proves the great interest of the engineering profession. I would like to add some pertinent statements to the discussion.

I was one of the originators of the prestressed concrete scheme for Walnut Lane Bridge, as mentioned by E. R. Schofield in ENR Dec. 30, 1948, p. 16, and by Sam Baxter at the First Conference for Prestressed Concrete, held in August, 1951, at Cambridge, Mass. My projects for Walnut Lane Bridge were concrete box-girder construction, prestressed with unbonded galvanized cables moving over saddles, with all stresses taken care of in good suspension-bridge tradition. From an esthetic standpoint, the project was very satisfactory.

However, the owners had two important misgivings. The first was that unbonded galvanized cables in an enclosed space, as well as the steel saddles and fittings, would require if not continuous maintenance at least continuous inspection. Secondly, the engineers of the City of Philadelphia did not feel that it was indispensable to go into the intricacies of computations for a suspension bridge of a mixed type; i.e., cables with a concrete stiffening truss. They fully recognized that the scheme was sound, and since it was presented by the Bridge Department of the John A. Roebling's Sons Co., it came from a most reliable source. However, they selected a scheme composed of single precast girders, which could be tested in a very convincing way; i.e., by loading to destruction a single beam. This scheme was naturally more expensive than it could have been otherwise, but still allowed the city an important saving.

From all of the above, it is clear that one cannot take the cost of this first prestressed concrete bridge as a yardstick for the cost of such bridges, in comparison to conventional methods of construction.

It so happens that the writer was connected over 40 years ago with the first long-span bridges built of reinforced concrete. These bridges were not cheap either. If their cost had been the paramount consideration, the building of conventional reinforced concrete bridges would not flourish as it does.

The relative cost of prestressed bridges and those of other materials cannot be solved by comparing structures built in different localities and under totally different conditions. The practical solution would be to include in all advertising for bids a proviso that prestressed concrete alternatives would be considered. In addition, sufficient time should be allowed for preparing designs and bids.

As it is now, only the successful bidder can put forward an alternative after he has obtained the contract. In Europe and Latin America, the method of getting bids for a bridge consists of issuing a general specification sufficiently detailed to allow fair competition. The contractors present their own designs in any material they please. In Belgium and France, and lately in Germany, many prestressed concrete bridges have practically knocked out competitors in conventional materials.

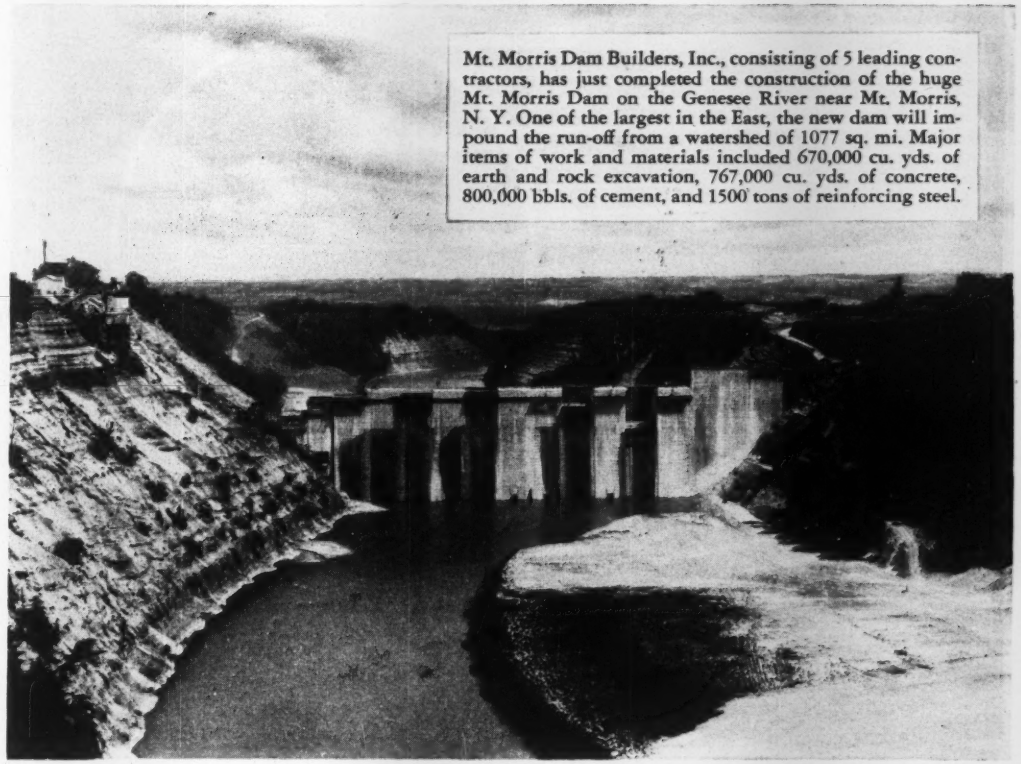
While a method which places the design entirely in the hands of the bidding contractors is not recom-

(Continued on page 14)

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on Mt. Morris Dam Project



Mt. Morris Dam Builders, Inc., consisting of 5 leading contractors, has just completed the construction of the huge Mt. Morris Dam on the Genesee River near Mt. Morris, N. Y. One of the largest in the East, the new dam will impound the run-off from a watershed of 1077 sq. mi. Major items of work and materials included 670,000 cu. yds. of earth and rock excavation, 767,000 cu. yds. of concrete, 800,000 bbls. of cement, and 1500 tons of reinforcing steel.

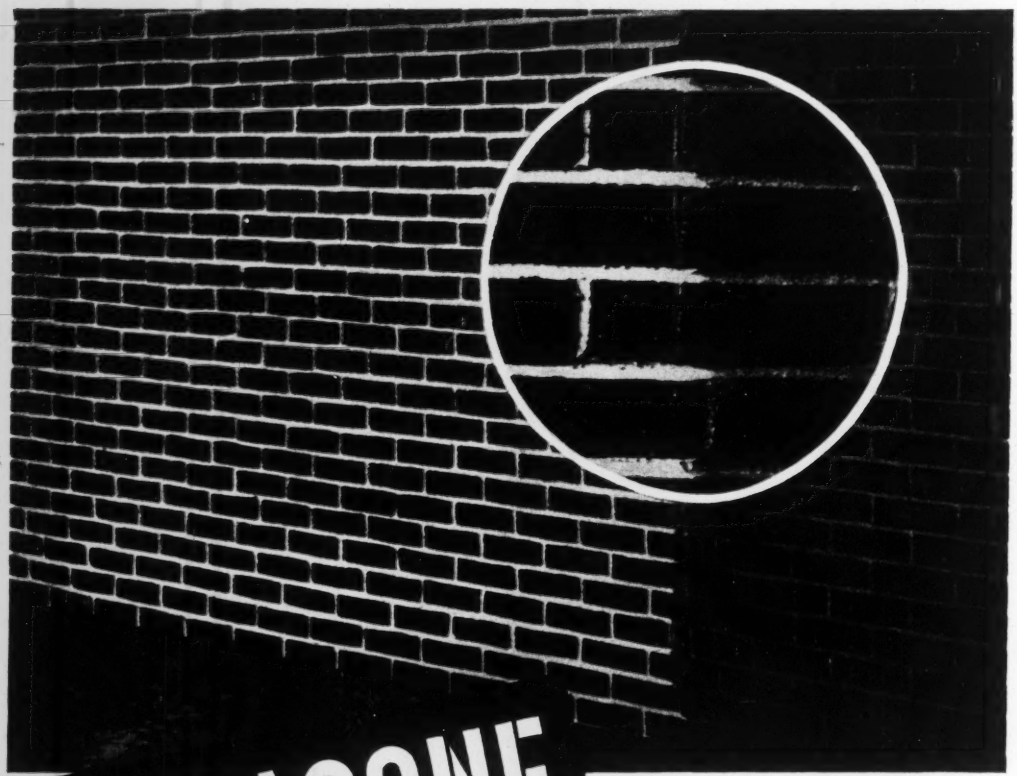
THE Mt. Morris Dam is a big construction project. It's the kind of job on which contractors don't take chances with their equipment. They want smooth, dependable operation and the best insurance they can buy against costly mechanical delays.

That's why Mt. Morris Dam Builders, Inc. selected Gulf quality lubricants and fuels—on the basis of experience and reputation. And they have obtained the kind of lubrication and fuel performance required to complete this important project ahead of schedule.

Write, wire or phone your nearest Gulf office today and arrange to use Gulf quality lubricants and fuels on your next job. They are quickly available to you through 1400 warehouses in 31 states from Maine to New Mexico.

GULF

REVOLUTION in



DARACONE

stops leaks invisibly!

Daracone is the *High-Silicone-Content* Water-Repellent that economically *waterproofs* any type of above-grade exterior masonry *without* affecting its appearance or "breathing" qualities.

Fully effective on new or old buildings.

IT IS NOT A "PAINT".

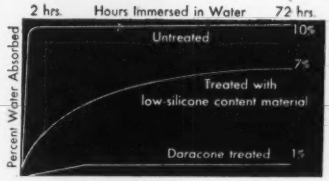
WATERPROOFING!

Now there is an easy, economical way to stop leaks in any type of exterior, above-grade masonry! DARACONE, a new, colorless, *high-silicone-content* water repellent, penetrates deeply into the masonry without affecting its appearance. It coats pores, fissures and cracks with an insoluble, non-oxidizing, invisible film of silicone. This effectively *stops* the capillary action by which water is absorbed. The pores and other voids are *not* clogged. It is the *repelling* action of silicone which keeps out water — even heavy, wind-driven rain.

DARACONE *also* ends the major cause of efflorescence. It protects against damage from freezing and thawing. It helps keep buildings clean, because water and suspended dirt *roll off* the masonry instead of being absorbed.

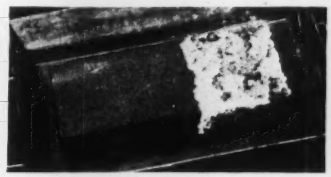
DARACONE can be quickly and easily applied by brush or spray in temperatures ranging from 100° to -15°. But remember, it will pay you to insist on Daracone, *because high silicone content is important.* Tests show it to be more effective . . . more durable . . . that one application will last 8 to 10 years or more.

Write for full information now!



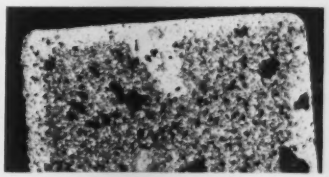
72 hour water immersion

After 72 hours' immersion in water, a moisture pick-up of less than 1% by weight proves DARACONE's greater ability to resist water absorption. Note that specimens treated with low silicone content material absorbed almost 7% moisture by weight, while untreated specimens absorbed 10% moisture by weight. All test specimens (mortar mix blocks made of 1 part cement, 1 part lime, 6 parts sand) were standard cured and immersed in ¼" water.



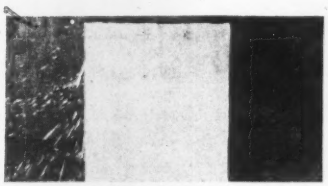
Daracone retards efflorescence

Half of the red clay brick had been coated with Daracone, and the other half left uncoated. Brick was placed in a 10% sodium sulfate solution. First traces of efflorescence appeared on the uncoated side within 24 hours; heavy bloom appeared in 72 hours. Note that the sodium salts *could not come to the surface* on the side coated with Daracone.



Penetration of Daracone

This sand lime brick was treated on all sides with Daracone, then cut in two. Cut section was immersed in water, then photographed. Light dry area around the edges shows the depth of Daracone water-repellency. Dark area shows wetting by water.



Concrete treated with Daracone

Before this concrete was wet down with a hose, the center was treated with Daracone. Note that the area treated with Daracone was so water-repellent as to remain completely dry and shows no darkening from water absorption. Also note the spatterings of Daracone which fell on the wall and made even those areas water-repellent!

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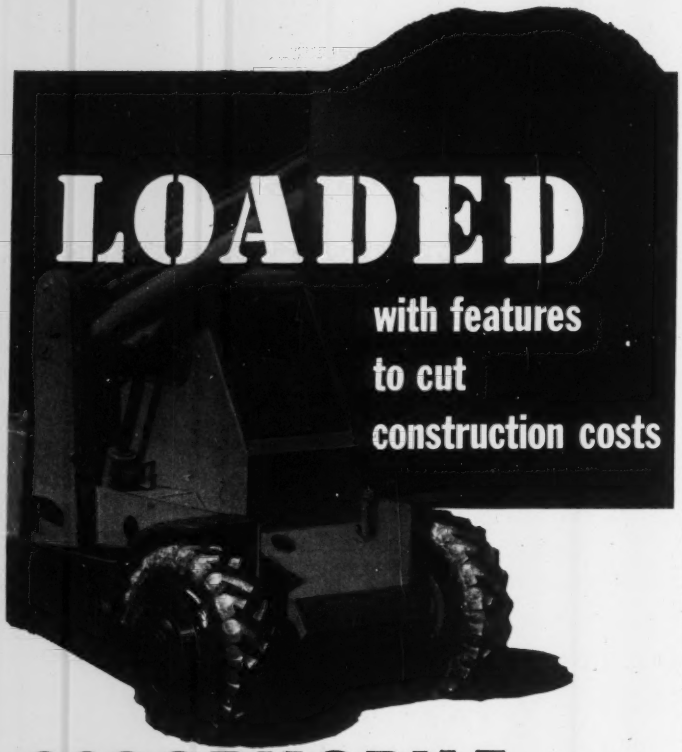

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(*Continued from page 10*)

mended, a willingness to consider alternative prestressed design should clear the question of the most rational solution to the satisfaction of the owners and their representatives.

L. Coff
Consulting Engineer
New York, N. Y.

Cooling tower for import

Sir: I have read with great deal of interest Arthur J. Fox's article, "Quenching Industry's Thirst" (ENR May 1, p 66). The emphasis that the power industry's water requirement is utilized almost entirely for cooling purposes, and that in the steel industry 83% of the total water used is for cooling, brings about too forcefully the fact that the time has come for the preservation and reutilization of cooling water.

One of the very successful methods for cooling water is through the use of hyperbolic reinforced concrete cooling towers. Such towers act only atmospherically, without use of induced draft fans, and many have attained a capacity of over 5mg per hour with not more than 1% make-up water.

Although such towers have not yet been built in this country, they are common land-marks throughout the globe. (ENR has recently published an article on French power constructions and shown the picture of such hyperbolic towers.) Such towers may attain a height of over 300 ft with a base diameter of 250 to 300 ft. The walls are of thin-shell construction.

As the power development in this country reaches into the water-short areas of the West and Southwest, positive means will have to be found for the reuse of water. However, even the Midwest ultimately may have to resort to cooling towers, considering the tremendous power requirements. As an example, one of the major power stations in planning stage will ultimately require as much as 60 mg per hour or the total capacity of the canal from which the water will be withdrawn.

One of the foremost designers of such hyperbolic cooling towers is L. G. Mouchel & Partners, Westminster, England. And recently an organization was founded, under the name of Intercontinental Technical Enterprizes, Inc., 677 N. Michigan Ave., Chicago, Ill., with the writer as one of the directors. One of the purposes of this organization is the design and promotion of the Mouchel type of hyperbolic cooling towers.

Paul Rogers
Structural Engineer,
Chicago, Illinois

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comfort features

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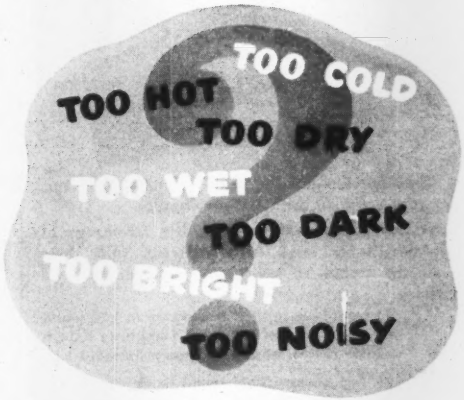
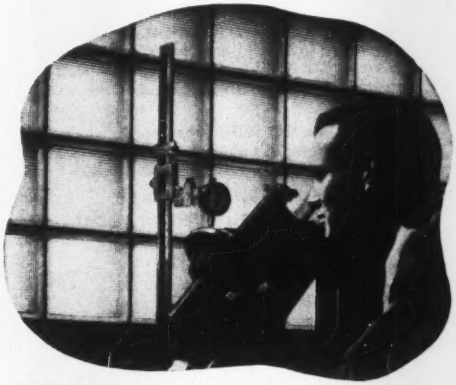


QUESTION . . . What kind of glass should we use in window openings to keep workers happy and comfortable?



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Other Facts: PC Glass Blocks reduce heating and air-conditioning costs; they seldom need repairs or replacements; they involve no periodic painting, puttying and caulking; they offer better protection against intruders and vandals; are immediately available.

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WILL THE MONEY KEEP COMING?

The continuing flood of new money-raising issues of stocks and bonds—both public and private—is beginning to raise some doubt as to the depth of the reservoir of money that supports them.

Up to now the news is basically good. With almost no exceptions, any proposal for new money is being received eagerly and sold quickly at good rates. The demand of the money market, fed by all of its standard sources and by new ones (include growing pension and welfare funds), seems insatiable.

But economists are beginning to post some signs that this can't keep up indefinitely—that cost of using money, therefore, may go up too high to make the borrowing practical. Thus, they cautioned restraint.

• Lots of work to be done—One of those warnings came this week when speakers before the Municipal Forum of New York first set a figure of $100 billion as what's needed in municipal and state public works alone in the next ten years; then warned that means of paying for such an enormous volume of work must be carefully considered.

Said Frederick L. Bird, forum president: There is a backlog of $100 billion in municipal public works, divided about as follows— $60 billion for roads; $15 billion for schools; $10 billion for hospitals; $10 billion for water supply and pollution controls; $5 billion for rapid transit, air terminals, parking facilities and the like.

• But how do you pay? Said Paul Studenski, economics professor at New York University: There is doubt that the nation's local governments can catch up with such a backlog without running the danger of ruining their own financial stability.

The thing to do, said Prof. Studenski, is to go a bit easier, figure to use "pay-as-you-go" schemes wherever possible. Nearly two-thirds of all outstanding debts of local governments are now held by individuals and commercial banks, he warned—and the capacity of such investors to absorb great quantities of new bonds has to have a limit somewhere.

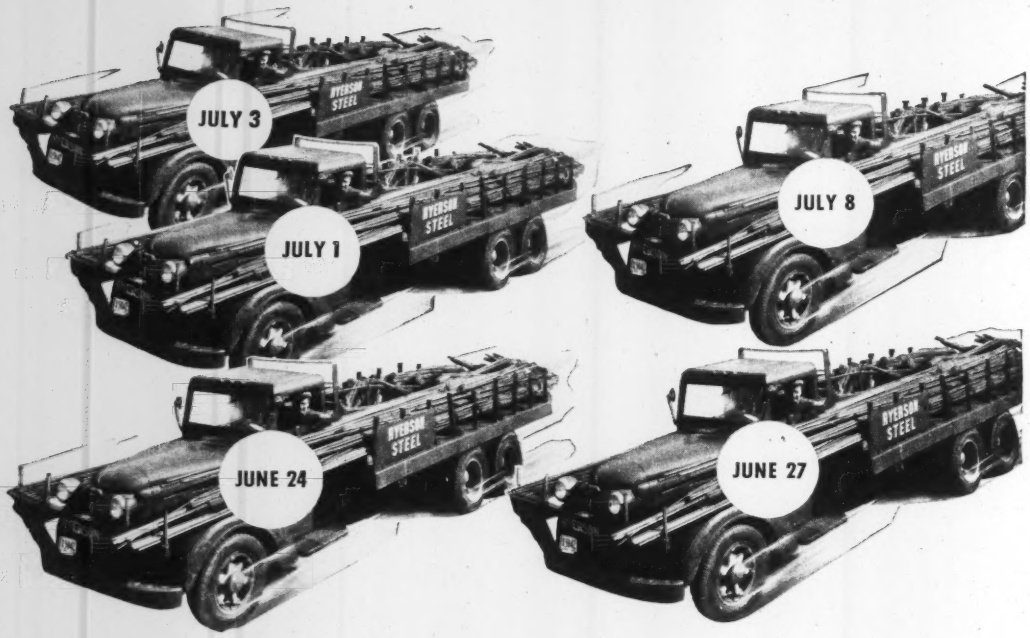
• States already worried—Many of the 48 states are already running into Dr. Studenski's problem: Increasing populations are creating demands for ever-growing state services, but inflation has increased to the point where the states can no longer finance such improvements out of existing revenue.

Results have been two: The states have been going more to the "pay-as-you-go" device through such things as toll highways (see p. 21) and have begun attempts to hold their expenditures in line with income. In an election year particularly, neither state nor national legislators want to be responsible for new or higher taxes.

The cities also have skirted gingerly around the problem: New York is already in trouble with its residents over a series of nuisance taxes, many another city also has sales taxes originally imposed perhaps for some such purpose as relief—but now undisguisedly going to pay off city obligations.

And of course the result of attempts at bond flotations, to tide local governments over financially, is only further congestion in the bond market.

The situation is further aggravated by the fact that after July 1, the government is going to begin borrowing on the heaviest scale since World War II in order to meet defense-swollen expenses. Even more significantly, it will open a new fiscal year on that date by returning to the most inflationary system of raising cash: selling securities to the banks.



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THE CONSTRUCTION WEEK

LESS MEANS MORE—Construction men can figure a 1952-53 military public works program of around $6 billion—largely because defense contracting is still running slow.

It works like this: Defense Department will wind up fiscal 1952 (June 30) with a bit over $3 billion in construction money for which no contracts have been let ("unobligated" in Pentagon jargon). And Congress sweetened that pot with authorization for another $2.7 billion for military construction.

You can add the left-over and the new money together, since construction funds are allotted under a "no year" appropriation good until spent.

SLOW SPEED AHEAD—There are a host of reasons why military contract letting has been slow up to now.

Biggest: The red-tape that requires endless review of contracts before they become firm.

Another: Politics—Congress has already happily investigated military contract letting in its lookout for charges of waste that can be converted into campaign material. So the military is foregoing the traditional last-minute rush to get money spent before new appropriations are due.

And one more: The military is battling Congress to raise a House-imposed $46-billion ceiling on spending. If it loses the battle, a lot of contracts let this year might have to be canceled or stretched out.

BOOKKEEPING—The bookkeeping involved is interesting and instructive.

The armed services started out the 1952 fiscal year with something like $68.7 billion on the books. That broke down this way: $4.8 billion for military assistance procurement; $4.5-billion carryover from fiscal 1951 (mostly construction money) and $64.2 billion in new appropriations (for items including pay and allowances, ammunition, supplies, etc.).

Out of this, the Defense Department got $5.7 billion for construction work (bringing the total construction money for the military since Korea to $7.6 billion).

Spending has been at the rate of about $41 billion for the year. But of that total, only about $2.7 billion went for construction.

HOUSING REPERCUSSIONS—And while Congress was eyeing the military contract situation, it had time to get itself into the fight over Los Angeles' $100-million public housing project. Congressmen considered three identical resolutions noting: the city council's action to cancel the city's participation in the 10,000 unit project; the overwhelming "No" vote by citizens June 3. They requested FPHA to cancel its agreement on the project.

FPHA responded quickly, announced it won't insist on proceeding, but noted plaintively that it had to get back some of the $13 million it had spent in federal funds.

IN THIS ISSUE—Toll roads become big business (p. 21) . . . Congress boosts federal aid to highways (p. 26) . . . Bridge collapse reports conflict (p. 28) . . . Steel strike hits construction (p. 29) . . . Engineer employees form bargaining group (p. 32) . . . How A-bomb workers live and travel (p. 36) . . . How to cope with special purpose doors (p. 42) . . . Engineers in the future (p. 49) . . . Chicago builds large water tunnel (p. 52) . . . First section of Toronto Thruway to be in service this summer (p. 70) . . . Franklin D. Richards, FHA commissioner, resigns (p. 88) . . . Simplified graphical method works blending aggregates (p. 108) . . . New York City provides case study on school construction costs (p. 135).

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On rainy nights when good visibility is needed most, reflecting curb is at its best. Rain-slick, the reflecting faces become even more mirror-like. Such curbs have excellent daylight visibility as well, since the true white of Atlas White Cement is in marked contrast to the grey pavement.

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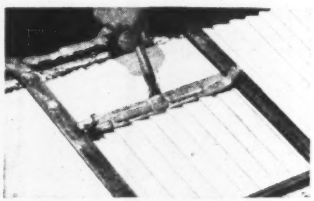

CLOSE-UP shows fast, easy placement. One method is to place Atlas White Duraplastic* mortar mix on a grey concrete base, screed to 1-inch thickness, and score with a hand tool. Contractors prefer Duraplastic because its air-entrainment feature makes the mix more workable, more plastic; makes placement and scoring easy.

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THE PENNSYLVANIA TURNPIKE set the pace as a money-maker. Built originally to provide an easier route through the mountains in the central part of the state, it now spans from the outskirts of Philadelphia to the Ohio line.

Toll highways become big business

V. T. Boughton
Associate Editor

THE FINANCING and operation of toll roads has moved over into the field of big business. That change is highlighted by the recent sale of $326 million in bonds by the Ohio Turnpike Commission. This sale came only a few weeks after the sale of $96 million to finance the West Virginia Turnpike, and the sale of $60 million in short-term notes to finance current work on the New York State Thruway. A day or two later the Oklahoma Turnpike Authority sold $7 million in bonds, thus bringing the toll-road financing this year to half a billion dollars.

If there is added to these figures the cost of the completed toll turnpikes in Maine, New Hampshire, Connecticut, New York, New Jersey, Pennsylvania, Florida and Colorado and the estimated cost of the toll highways actually under construction or authorized in Massachusetts, New York, New Jersey, Pennsylvania, Georgia and Oklahoma, it will be seen that the total investment in toll roads soon will be above two billion dollars.

• **Mileage of toll roads grows**—In mileage as well as investment, the toll highways are setting an impressive record. Excluding some small scenic highways on which tolls are collected, the principal toll highways in operation in this country have a total mileage of 752. When the length of toll roads under construction or definitely authorized is added, the total rises to 2,160 miles; and when projects being actively considered are included the grand total rises to 3,348 miles.

• **Systems take shape**—Work will start soon on a connection between the Pennsylvania and New Jersey Turnpikes and on the Ohio Turnpike. When they are completed there will be a continuous toll superhighway from New York and Philadelphia almost to the Indiana line. Completion of the New York State Thruway and the Massachusetts East-West Toll Highway, which is to be connected to the Thruway by a link through the Berkshire Mountains, will create another toll superhighway from Boston to the Pennsylvania line near Erie.

THE COVER PICTURE

Pictured on the cover of this issue is New Jersey's Turnpike at the Newark Airport interchange on Feb. 24—the Washington's Birthday weekend—when the traffic volume attained a record of 84,000 vehicles, far above the engineers' most optimistic predictions. Over the Memorial Day weekend, despite rain, 381,704 vehicles used the turnpike, with a peak daily count of 76,000.

Cover photo by Ostergaard

Less obvious is the fact that a north-south toll superhighway system is beginning to take shape with the West Virginia Turnpike as a nucleus. It would serve traffic from the Cleveland-Detroit area bound for Florida. This system is of interest because, like the original Pennsylvania Turnpike, it is designed to provide a highway with better grades and less curvature through a part of the Appalachian Mountains.

• **Penn Turnpike sets the pace**—There can be little doubt but that the financial success of the original Pennsylvania Turnpike is the source of most of the current interest in toll highways. That highway was built when construction costs were low in relation to today's costs and its financing was aided by a grant of $29,250,000, from the Public Works Administration.

Providing an easy-grade route through the most mountainous parts of Pennsylvania, this highway met a long-felt need. Nevertheless, due to gas rationing during World War II, its income was mostly below estimates until 1946. Since the end of rationing, however, the turnpike's income has risen steadily until last year the gross income was almost $14 million against operating costs of $2,675,000 and interest requirements of $1,058,000 on bonds issued to cover the original construction costs, which were refunded in 1948.

Interest payments on bonds issued

SUMMARY OF TOLL HIGHWAYS

BUILT AND IN SERVICE

Name	Length Miles	Cost
Overseas Highway (Key West)	122	$ 8,500,000
Pennsylvania Turnpike	327	240,750,000
Westchester County (N. Y.) Parkways	25	25,000,000
Merritt and Wilbur Cross Parkways in Connecticut	67	38,000,000
Maine Turnpike	44	20,600,000
Buccaneer Trail, Florida	17	4,600,000
New Hampshire Turnpike	15	7,500,000
New Jersey Turnpike	118	255,000,000
Denver-Boulder Turnpike	17	6,000,000
	752	$605,950,000

UNDER CONSTRUCTION

New York State Thruway	535	$500,000,000
Turner Turnpike (Oklahoma)	88	38,000,000
	623	$538,000,000

AUTHORIZED

		Estimated Cost
Ohio Turnpike	241	$326,000,000
Carolina-Virginia Coastal Toll Road	54	2,450,000
Pennsylvania-New Jersey Turnpike Connection	39	*50,000,000
Georgia—Cartersville to Tennessee line	65	*52,000,000
West Virginia Turnpike	88	96,000,000
Garden State Parkway, New Jersey	168	285,000,000
Massachusetts East-West Toll Road	130	150,000,000
* Unofficial estimate	785	$961,450,000

PROJECTED

	Length, miles
Indiana Turnpike	190
Maine—Extension of Maine Turnpike to Augusta	58
Massachusetts—Wilbur Cross Highway to N. H. Turnpike	110
Virginia—West Virginia line to North Carolina line	75
" —Richmond bypass	30
North Carolina—Virginia line to Charlotte	125
Florida—Jacksonville to Miami	350
Wisconsin—Part of new highway, Chicago to Twin Cities	250
	1,188

to build the Eastern Extension began last year. Interest payments on bonds issued to build the Western Extension begin this year, as does the required repayment of principal of the Turnpike System Bonds. These payments were scheduled to total $6.5 million this year and reach a peak of $9.9 million in 1958 when, by present indications, the gross income will be close to $20 million and operating expenses will not be much higher than they were last year.

As of June 1 this year, the retirement of bonds was four years ahead of schedule.

• **Maine's record less spectacular**—The 44-mile Maine Turnpike, opened to traffic late in 1947, was the second modern toll road to be built by a public agency set up for that purpose but was the first to be financed entirely by revenue bonds. Those bonds were marketed before the Pennsylvania Turnpike's spectacular record had created a favorable market for turnpike bonds and so were given very conservative retirement features.

Because gross income during the first year of operation was below the engineers' estimates and operating costs were higher than anticipated, the toll for passenger cars—set originally at 50¢—was raised to 60¢ in 1949. Last year it was raised again to 75¢.

Meanwhile the traffic volume has increased steadily and now is well above the engineers' estimates. The income to date has been adequate to meet bond interest and operating costs, and with the higher rates now in effect will provide an ample margin above bond repayment requirements, which do not reach a peak until 1974.

• **New Hampshire Turnpike pays**—Following completion of the Maine Turnpike to the New Hampshire border, the state of New Hampshire built a 14-mile continuation paralleling U.S. Route 1 along the coast to the Massachusetts line. It was completed in the summer of 1950 at a cost of $7.5 million, using state funds. A 15¢ toll is charged, and the income has been well above the engineers' estimates.

• **New Jersey sells bonds easily**—By the time New Jersey Turnpike Authority came to seek buyers for the $230 million in bonds it planned to issue to finance its 118-mile toll highway, the successful financial record of the Pennsylvania Turnpike had been well publicized in financial circles. An advantageous refunding operation by the Pennsylvania commission, carried on a few months earlier, had paved the way for more toll-road bond issues. Consequently, the New Jersey Turnpike Authority found insurance companies so anxious to take its bonds that they proposed a special plan for handling the issue.

Acceptance of that plan made it possible for the authority to cut the initial bond issue to $220 million. A year later, when rising land and construction costs made an additional issue of $35 million necessary, the authority had no difficulty in selling those bonds as well.

• **Higher income needed**—New Jersey's turnpike cost over $2 million a mile, as against less than $500,000 a mile for the original Pennsylvania Turnpike. This indicates the much higher income that must be obtained to make the New Jersey Turnpike a financial success.

Traffic studies, made on a conservative basis, showed that there should be traffic enough to carry the operating and financing costs at toll rates that could be justified by potential savings to users.

When the rates were set, an effort was made to have them bear some relation to the cost of the section to which they applied. In the southerly part of the state, where no unusual construction costs were encountered, the passenger vehicle rate averages slightly over one cent a mile, or substantially the same as on the Pennsylvania Turnpike. But on the costly northern sections, tolls rise to a maximum of 3.9¢ per mile. The overall

AN EAST-WEST TOLL ROAD SYSTEM that has been in the making for several years soon will reach from New York City to the Indiana line. Present planning may take it close to Chicago. Also in the making is a north-south toll highway system to replace the present tortuous routes by which southbound traffic from the Great Lakes region crosses the lower Appalachian Mountains.

rate for passenger vehicles is 1.5¢ per mile.

The entire turnpike was not put into operation until early this year. Traffic during the first four months of 1952 totaled to over 4 million vehicles or well over half the estimate of 7,600,000 vehicles for the entire year made in 1949. If the average daily figure of 45,000 in April is maintained during the remainder of the year, the total for 1952 will be more than double the engineers' estimate.

The number of trucks, which was originally estimated at only 5% of the total, is up to 8%.

• Florida's Overseas Highway pays—Less well known among the nation's toll roads is the 122-mile long Overseas Highway from Florida City on the Florida main land to Key West. A 32-mile section of this road, built on the viaducts and right-of-way of the Florida East Coast Railway's abandoned line to Key West, is operated as a toll road by the Overseas Road and Toll Bridge District, a state agency. A toll of $1.00 plus 25¢ for each extra passenger is collected. Estimates place the income for the current year at $980,000.

During the past few years the income has been sufficiently far above operating and financing requirements to cause the State Road Department to make a study of the possibility of lifting or reducing the tolls in the near future. This will be done unless the study indicates that unusually large expenditures for maintenance of the long viaducts must be made in the near future.

• One project in the red—Florida has another toll road, however, that has quite a different financial record. It is the 17-mile Buccaneer Trail, which was opened in the fall of 1950 as a bypass around Jacksonville and to give better access to beaches and park areas along the coast east of that city. A ferry across the mouth of the St. Johns River is included in the project.

Supported by an engineering study showing sufficient potential traffic and by a pledge of $40,000 annually from the gas-tax receipts of Duval and Nassau counties, the Ocean Highway and Port Authority of Fernandina, Fla., issued $4.6 million in bonds to cover the cost. But the traffic count was predicated on improvement of some connecting highways and the development of coastal park areas which have not yet been carried out. As a result, although traffic has increased slowly since the highway was opened, the income has not been sufficient to cover operating and financing costs.

Early this year a refinancing plan was adopted. Under this plan, the state has made up the deficiencies in interest payments and will carry the operating and maintenance costs as long as necessary.

The area now served by the Buc-

cancer Trail lies just south of the St. Marys River, which forms the border between Florida and Georgia along the coast. Recently the Georgia legislature authorized the Ocean Highway and Port Authority to extend the Buccaneer Trail to some point not more than 50 miles north of the Florida border. This would permit tapping U. S. 17 as far north as Brunswick, Ga., to obtain more traffic.

• **No takers for the bonds**—A toll-road project that appears to have folded up for lack of purchasers for its bonds is a proposed highway along the Atlantic seaboard from Virginia Beach, Va. to the Nags Head-Kitty Hawk area in North Carolina, a distance of 54 miles. It was sponsored by the Coastal Turnpike Authority of Virginia and the Carolina-Virginia Coastal Highway Corp. of North Carolina, both state agencies.

Planning for this project was carried to the point of making detailed engineering plans, taking bids and awarding construction contracts for the highway and bridge work, subject to the sale of bonds. No takers were found for the bonds.

• **Oklahoma turnpike has problems**—Oklahoma set up its Turnpike Authority in 1947 to build a toll road from Tulsa to Oklahoma City, a distance of 93 miles. That was before the Pennsylvania Turnpike had begun to make headlines as an income producer. As a result, the authority had difficulty in finding financial backers. Cost estimates appeared high in relation to potential traffic. Even the RFC would not take its bonds.

Due to this situation, the length of the highway was cut from 93 to 88 miles, eliminating some costly interchanges. By the time the Oklahoma Turnpike Authority came to make a new call for bids on its bonds in November, 1950, there had been a material increase in the potential traffic and the investment market was more receptive to toll-road bonds. As a result, the authority was able to sell $31 million in bonds to private investors.

Since construction started early last year, construction costs have exceeded the estimates. Consequently, $7 million more in bonds was sold recently to complete the project.

• **Denver-Boulder Turnpike prospers**—Most recent toll road to be put into service is the 17-mile turnpike designed to cut 8 miles off the distance between Denver and Boulder, Colo. Built at a cost of $6.3 million, the road was opened in January, 1952. Traffic to date has been well above the engineers' estimate.

The Denver-Boulder Turnpike was built by the State Highway Department with bonds backed by tolls plus a pledge of up to 30% of interest requirements on all but $1 million of the cost, payable from the state-highway fund. Toll for passenger cars for the 17.3-mile distance is 25¢.

I. A new North-South route

Toll roads that ultimately could form a new route through the Appalachian Mountains for traffic from the Great Lakes region to Florida are in various stages of planning in West Virginia, Virginia and North Carolina. Most advanced are plans for the West Virginia Turnpike.

• **West Virginia Turnpike financed**—Ground will be broken soon for the West Virginia Turnpike, an 88-mile toll highway from Charleston, West Va., to Princeton, which is in the southern part of the state near the Virginia line. Bonds of the West Virginia Turnpike Commission totaling $96 million with an interest rate of 3¾% were sold in April to finance the work. They were taken up quickly.

As first projected, this turnpike was to run in a north-south direction across the entire state from Parkersburg to Bluefield. But in the later planning, because of highway modernization work between Parkersburg and Fairplain, 30 miles north of Charleston, Fairplain was set as the northern terminus. Princeton, rather than Bluefield, was selected as the southern end.

Still more recently, Charleston was made the northern terminus.

Because of the mountainous character of the region through which this highway is to be built, its cost will average over $1 million per mile. And that cost figure includes the laying of only two lanes of a divided highway initially, with a third lane for passing on steep hills.

Construction is expected to start in August.

BONDS ISSUED FOR TURNPIKE CONSTRUCTION

(Backed by revenues from turnpike only)

Pennsylvania Turnpike Commission	$47,000,000 @ 2.25%
	87,000,000 @ 3.25%
	77,000,000 @ 2.90%
Maine Turnpike Authority	15,000,000 @ 2.50%
	5,600,000 @ 2.75%
Ocean Highway and Port Authority (Florida)	4,600,000 @ 4.00%
Oklahoma Turnpike Authority	31,000,000 @ 3.41%
	7,000,000 @ 3.84%
New Jersey Turnpike Authority	220,000,000 @ 3.25%
	35,000,000 @ 3.20%
West Virginia Turnpike Commission	96,000,000 @ 3.75%
Ohio Turnpike Commission	330,000,000 @ 3.25%

BONDS BACKED WITH STATE CREDIT

New Hampshire Department of Highways	$7,500,000 @ 1.6%
Colorado Department of Highways	*6,300,00 @ 2.9%

* These bonds were backed by state credit up to 30% of the interest on $5,300,000.

• **A link across Virginia**—To continue this new north-south superhighway across the western tip of Virginia, the Old Dominion Turnpike Corp., in 1951, obtained a charter from the State Corporation Commission of Virginia to finance and build a private toll highway from the West Virginia line below Princeton to a point on the North Carolina border near Mt. Airy, about 75 miles.

Engineers have been engaged and aerial surveys for the project are under way.

Up to the first of this year, Virginia had set up one public body and had granted charters to two private corporations to build toll roads. The Old Dominion Turnpike Corp. is one of the private agencies. The other is the Commonwealth Turnpike Corporation, which was chartered to build a private toll highway from a point north of Richmond to a point south of Petersburg, roughly parallel to U. S. Route 1, to provide a bypass for both those cities. It appears to have made no progress.

The public agency is the Coastal Turnpike Authority, whose failure to get financial backing for its project has been noted previously.

Early this year, upon the recommendation of the Virginia Highway Commission, the legislature passed a bill authorizing the commission to build and operate toll highways. This was done to make certain that any future toll road projects would fit in with the commission's overall plans.

• **North Carolina plans turnpikes**—Construction of still another link in the projected north-south highway toward Florida was made possible by the North Carolina legislature last year when it set up the North Carolina Turnpike Authority. That authority

NEW JERSEY'S TURNPIKE has attracted so much more traffic than the engineers estimated that additional lanes and toll booths are being added at some points to eliminate congestion at entrances and exits.

is now studying the possibilities of building a toll highway across the central part of the state from a connection with the projected Old Dominion Turnpike in Virginia, near Mt. Airy, to Winston-Salem and on south to Charlotte, a distance of about 125 miles. Whether this toll road will be built will depend in large measure on whether the connecting road in Virginia is built.

• **South Carolina has no plans**—No plans are being made to carry the new north-south highway across South Carolina or Georgia, but in Florida the possibility of building a toll highway from Jacksonville south through the lake region and on down to West Palm Beach and Miami is under study. Owners of motels and towns on the existing main highway down the east coast are reported to be opposing the plan actively.

• **Another north-south route?**—Although Georgia has done nothing toward continuing the projected highway across West Virginia, Virginia and North Carolina, its legislature did create early this year a Georgia Turnpike Authority for the specific purpose of building a toll highway from Cartersville to the Georgia-Tennessee state line, a distance of about 65 miles. Such a highway, presumably, would be roughly parallel to U. S. Route 41, the main highway between Atlanta, Ga. and Chattanooga, Tenn., which is one of the main routes now followed by traffic between Midwest cities and Florida.

Recently, Governor Gordon Browning of Tennessee announced that he will ask the legislature next January to authorize construction of a toll road along this same route from Chattanooga to Knoxville.

Governor Browning also plans to ask the legislature to authorize an east-west toll road across Tennessee from Memphis to Bristol, which, presumably, would connect with the north-south highway near Knoxville, thus serving north-south traffic as well.

II. Progress on east-west systems

As noted previously, the initial east-west system of toll highways that has been developing around the original Pennsylvania Turnpike as a nucleus lacks only the Ohio Turnpike and a 39-mile link between the eastern extension of the Pennsylvania Turnpike and the New Jersey Turnpike to carry it from the Atlantic Seaboard to the Indiana line. Both have been authorized, and the Ohio Turnpike Authority just sold $326 million in bonds to finance its work, which is expected to be under way before the year is out.

The legality of the sale of the Ohio bonds now is under review by the state supreme court.

Financing the Pennsylvania-New Jersey link will present no special problems. Recently the Pennsylvania commission, which will build the greater part of the connecting highway, announced a route skirting suburban Philadelphia at the north to a crossing of the Delaware River a few miles above the present Burlington-Bristol bridge, where a new bridge will be built. Construction is expected to take about two years.

• **Ohio plans take shape**—Present plans of the Ohio Turnpike Authority call for the earliest possible start on the eastern end of its 241-mile toll turnpike in order to give traffic moving to and from the western end of the Pennsylvania Turnpike better connections with existing main highways in the eastern part of Ohio. Completion of that work will require 16 months after delivery of the bonds, and completion of the entire project 34 months. Construction of the project is estimated to cost $283 million.

• **Indiana starts planning**—Plans to carry this east-west highway across Indiana also are beginning to take form. The Indiana Toll Road Commission, set up last year by the state legislature, has under study a highway across the northern part of the state that would form a continuation of the Ohio Turnpike toward Chicago, with spurs to Fort Wayne and to the Michigan line near Elkhart. The constitutionality of the act is now being established in the courts, and negotiations for engineering studies are under way.

• **No toll road in Illinois**—To date Illinois, has not caught the toll road fever. F. N. Barker, chief highway engineer, states that his department believes that it can provide highways adequate for the state's needs without resort to toll financing. That is due, primarily, to the fact that the state diverts very little of its motor-vehicle income to other than highway purposes.

Mr. Barker states that the planned expressway system for the Chicago region, part of which is under construction, will be adequate for traffic brought to Illinois by the Indiana Turnpike, if it is built.

Much the same applies to traffic that might originate from the toll highway now under discussion in Wisconsin to provide an improved route from Chicago across Wisconsin to Minneapolis and St. Paul.

In Wisconsin, the Highway Com-

mission is making preliminary estimates of the cost and potential traffic for such a highway for the Highway Advisory Committee of the Wisconsin State Legislative Council.

• **Toll roads in the Southwest**—In March of this year, Governor Johnston Murray of Oklahoma proposed to the governors of Texas, Kansas and Missouri that they join in planning a toll road system that would tie in the Missouri cities of St. Louis, Kansas City and Joplin with Topeka and Wichita in Kansas, Tulsa and Oklahoma City in his state and Denton, Texas. In response, the Missouri legislature recently set up a joint legislative committee to study the proposals. No formal action has been taken in either Kansas or Texas, but the Kansas State Chamber of Commerce is considering the plan to determine whether to support it.

III. A second system in the East

A sudden change of thinking toward toll highways on the part of the Massachusetts legislature has laid the groundwork for a second toll highway net in the east extending from the Atlantic ports of Boston, Providence and New York to the Lake ports of Buffalo, N. Y., and Erie, Pa. It will be made up of the New York State Thruway and the East-West Toll Road in Massachusetts.

• **New York State Thruway**—Two sections of the New York State Thruway totaling 41 miles are in operation (but no tolls are being collected), and about 100 miles are in various stages of construction. When completed in 1954, the thruway will have a total length of 535 miles. This includes the Berkshire section, designed to connect with the toll highway across Massachusetts, and the New England section, which will be part of the reconstruction of the Boston Post Road (U. S. Route 1) through the suburban communities on Long Island Sound north-east of New York City.

Construction costs are to be met by an issue of up to $500 million in bonds backed by the state's credit. When the Thruway Authority was first set up, it was authorized to sell bonds backed only by income from tolls or from the sale of permits to use the thruway, but last fall the state's constitution was amended to put state credit back of bonds issued to build the thruway. Large savings in interest payments are anticipated as a result.

The plan to sell annual permits to owners of cars registered in New York State has been retained, but tolls will be collected from all other users at most interchange points.

• **Tolls approved in Massachusetts**—In May the Massachusetts legislature, after having turned thumbs-down on toll financing for years, approved without opposition a plan to build a badly needed cross-state highway as a toll facility. From the outskirts of Boston it will run in a south-westerly direction past Worcester to a point where it will connect with the recently rebuilt highway connecting with the Connecticut parkways, thence west to a connection with the New York State Thruway.

From below Worcester to Boston this east-west toll highway will follow the route of a north-south toll highway that has been proposed as a connection between the toll highway and parkway system in Connecticut and the Maine and New Hampshire turnpikes. That fact, plus the fact that the new east-west highway will connect near Boston with the new free bypass highway leading to the north around Boston to the Newburyport Turnpike—which is being rebuilt as a free dual highway—would appear to preclude any further serious consideration of the north-south highway.

In Maine, extension of the Maine Turnpike to Augusta is under study.

• **Garden State Parkway**—During the past few years, the New Jersey Highway Department has been building short sections of a parkway designed to give the suburban districts of northern New Jersey better facilities for reaching the shore resorts of the central and southern parts of the state. Starting near the New York State line, this parkway will run south through the eastern part of the state to Cape May, a distance of 168 miles. To date, 15 miles have been completed and 9 more are under construction. The cost is estimated at $285 million.

Early this year, the New Jersey Legislature decided to resort to toll financing to speed completion of the project. To that end, it authorized the State Highway Department to set up a special authority which could issue bonds backed by tolls to finance and build the project. At the same time the legislature voted to submit to referendum vote in the fall a bond issue of $285 million, backed by state credit, to finance the work. As such bonds could be sold at lower interest rates than parkway authority bonds, large savings in the cost would be possible.

Congress ups

Congress has authorized the appropriation of $550 million for federal aid to highways in each of the two fiscal years beginning July 1, 1953. This is $50 million more than the current federal-aid authorization and marks a signal victory for the advocates of bigger road building programs.

Cutting federal aid to the basic highway systems from the current rate of $500 million to $400 million had been recommended to Congress by President Truman in his annual budget message. Such a cut was strongly opposed by the American Association of State Highway Officials and the American Road Builders Association as well as by Senator Dennis Chavez, leader of the group in Congress that has been trying to expand the nation's road building program. Senator Chavez sought to have the total for each year set at $600 million for the primary, secondary and urban systems.

• **Other work included**—Appropriations authorized by the new federal aid act total $1,386,650,000 because money for park and forest roads and other special purposes are included. Details are given in the accompanying table.

NEW FEDERAL ROAD MONEY

(To be appropriated for each of Fiscal years 1953 and 1954 in millions)

Primary Highways (rural)	$247.5
Primary Highways (urban)	137.5
Secondary Highways	165
Total Federal Aid to States	$550
Interstate Highway System	25
Forest Development Roads	22.5
Forest Highways	22.5
Nat. Park Roads	10
Parkways on Public Lands	10
Indian Res. Roads	10
Surveys for Ind. Res. Roads	2.5
Total Federal Work	$102.5

(To be appropriated to cover the two fiscal years)

Additional Work on Baltimore-Washington Parkway	$1.5
Emergency Use by Commissioner of Public Roads	10
Defense Access Roads	50

(To be appropriated for work in Central America)

Inter-American Highway	$16
Rama Road in Nicaragua	4
TOTAL	$20

highway aid, other bills advance

States are required to match the $550 million in regular federal aid on a 50-50 basis. Some matching of money to be appropriated for work on the Inter-American Highway in Central America also is a requirement.

Authorization of $4 million for further work on an east-west highway across Nicaragua from the Gulf of Mexico to the Pacific stirred up a row in the Senate that delayed final action there. Aid to Nicaragua in building such a road was authorized by President Roosevelt during World War II to provide an emergency highway. Appropriation of additional money was finally approved as fulfilling a moral obligation. The money is to be spent for road work between San Benito and Rama, but none is to be spent beyond Rama unless matched by Nicaraguan funds.

Reg X opposition . . .

Senate and House conferees will be under heavy pressure to kill housing credit restrictions when they sit down in conference to work out a compromise on extending economic controls. The House Banking Committee, last week, killed all credit restrictions, including Reg X, but the Senate continued authority for Federal Reserve Board to impose credit restrictions.

Conferees will be under pressure from building industry to go along with House Committee action and there's a better than 50-50 chance that they will do that. The building industry was angered rather than mollified by FRB easing of Reg X last week and is more determined than ever to kill the regulation completely.

There's only one thing that bothers them: the supply of mortgage money. Senate committee members point out that lowering down payments will put additional pressure on an already tight money market. Also, some Senate committee members have predicted that killing Reg X would bid up materials and shift building to higher priced housing where there is a pent-up demand. Some go so far as to predict this would push housing starts to somewhere between 1,700,000 and 2 million in comparison with starts of a little over a million for this year. This will add additional pressure to money market, they point out, and will work to the disadvantage of builders in the South and West where money tightens up first.

Big mortgage money is concentrated in the Northeast, which means that builders in other sections who are unable to get money locally would have to pay a premium on money from the East. It might even wipe out the GI loan program, they warn, where money is extremely tight now. But Congressman Patman (D., Tex.), who led the move in House committee to take away FRB's credit control authority, is an avowed enemy of FRB and is expected to stand pat in conference, regardless of effect of killing Reg X.

More air bases . . .

The House voted an authorization of $2,758,318,000 for construction of military and naval installations. The program includes secret work at overseas air bases from which American atomic bombers could "saturate" Russia within a few days in event of war. The program calls for work at some 250 bases here and overseas, but the secret work was not listed. Few of the bases, however, would be built from scratch. Most are reactivated World War II installations, or postwar bases on which work was begun under previous legislation.

Lion's share of new authorization—$2,089,277,000—goes to the Air Force and most of it would be spent overseas. The legislation tabulates $111,099,000 of this overseas work, another $1,133,938,000 would be spent on classified projects, mostly overseas.

The bill also carried an outlay of $383,291,000 for Army construction and $285,750,000 for the Navy. The bulk of this work, listed in the legislation, covers expansion, improvement, and reactivation of bases in this country and abroad. The bill, passed on a 332-to-7 vote, now goes to the Senate.

Other action . . .

. . . A bill providing $666.7 million for Army civil functions—most of it earmarked for flood control and rivers and harbors projects—during the coming fiscal year went before the Senate this week. As reported by the Senate Appropriations Committee, it is approximately 35% more than the House voted and $45 million less than the President had budgeted. It contains $227 million for rivers and harbors, $302 million for flood control, $62.5 million for flood control on the lower Mississippi River and tributaries, and $19 million for the Panama Canal Zone.

. . . Both Senate and House passed and cleared for President's approval, a bill to authorize $18,200,000 for construction of facilities for generating hydroelectric power at the Cheatham Dam on Cumberland River, Tenn.

. . . The Bailey subcommittee of the House Committee on Education and Labor reported favorably to full committee H.R. 8145—a committee compromise bill—providing for construction of schools in critical defense housing areas and to aid other states in urgent need of school facilities. The bill would extend and make some changes in Public Law 874 of 81st Congress which permits federal government to provide temporary supplementary aid for schools in critical defense housing areas, and to make grants to states where a distressed school facilities program exists.

The Bailey bill sets a complicated formula under which communities qualify for aid and an equally complex formula for determining amount of aid that may be granted.

. . . A showdown is brewing in Congress over who'll administer a small projects program designed to reclaim arid land in western states. This is primarily an irrigation project and would fall under jurisdiction of Bureau of Reclamation, but Secretary of Agriculture Brannan has made a move to bring the program under Dept. of Agriculture. This move brings him into conflict with Reclamation in addition to Corps of Engineers with whom he is feuding over flood-control program. Brannan opposed the Bosone bill (H.R. 7084) now before House Interior subcommittee, which would set up a program in which local communities would work with Interior Dept. on projects. After opposing Bosone bill, Brannan got Rep. Poage (D., Tex.) to introduce a bill before House Agriculture Committee that would authorize Agriculture to make the survey and provide grants—not loans—to communities, which would bear some part of the costs. Critics of the bill say it would give undue discretion to Secretary of Agriculture in administration of grants, which would subject program to political abuse.

An Agriculture subcommittee reported the Poage bill favorably to the full committee without hearings. Full committee, however, plans to hold hearings before acting on it. So far, Interior subcommittee has not taken any definite action with regard to the Bosone bill.

OVERPASS FAILURE in Boston, Mass., is attributed by consulting engineers to horizontal thrusts caused by excessive tipping of rocker supports under beams.

Bridge collapse traced to rockers

Five consulting engineering firms blamed the May 22 collapse of a 96-ft span of the new Sullivan Square overpass in the Charlestown section of Boston, Mass., on the rocker support of the beams. State Department of Public Works officials concurred in this finding.

Four engineering firms expressed the opinion that the Lehigh Structural Steel Co., of New York City, to which the steel erection had been subcontracted, had placed rocker supports improperly under the ends of the 17 steel girders in this span, causing a thrust on the three-column steel bent. This, the consultants claimed, led eventually to the rocker-supported girder ends falling to the ground.

William F. Callahan, commissioner of the State Department of Public Works, reported the possibility that disturbances of extraneous origin might have caused the rockers to tip excessively and drop the beams.

D. B. Steinman, consulting engineer of New York City, retained by Lehigh, said there was "no faulty fabrication of steelwork or faulty erection or construction of the structure." He attributed the failure to "inherent instability" of the bent on which the rockers were supported, in conjunction with the rocker detail. In other words, if the rockers had been installed vertically to begin with, only a slight deviation from the vertical, brought about by any cause whatsoever, would cause them to continue to tip, exerting larger and larger forces on the bent, until it deflected sufficiently to drop the beam ends.

• **Bent not supported at top**—The overpass consists of steel bents, spaced at varying distances, founded on spread footings and capped with deep steel girders, on which the longitudinal floorbeams rest. The beams, in turn, carry a four-lane concrete pavement.

At one end of the 96-ft span, each beam is riveted to a bent; at the other end, the beam is supported on a rocker designed to permit expansion and contraction of the deck and floorbeams. The bent that supported the rocker end of the span that collapsed also carried the rocker end of the adjoining span. Thus, this particular bent was "free-standing."

Prior to the accident, all the steel had been erected. Concrete had not yet been placed on the span that failed but had been cast on the other span carried by the free-standing bent.

No work was under way on the span at the time of the collapse, 8:15 pm on May 22. But during the day, in the vicinity, piles had been driven, steel had been riveted on the adjacent elevated railroad structure, which also had carried trains that set up vibrations, and a heavy volume of automobile and truck traffic had passed by.

Commissioner Callahan reported that these disturbances might "have caused a movement of the rockers from the position in which they were left by the steel erection company to a more angular position, creating a great horizontal thrust. . ."

• **Rockers were tipped**—After the accident, engineers of the State Department of Public Works investigated. The department also engaged Charles T. Main, Inc., consulting engineers, of Boston, to report on the adequacy of the design and the cause of the failure. Thomas Worcester, Inc., who designed the structure and supervised construction, requested the engineering firms of Fay, Spofford & Thorndike and Hayden, Harding & Buchanan—all of Boston—also to determine independently the cause of the structure's failure.

All subsequently agreed that the steel erection subcontractor had installed the rockers at the end of the span that collapsed at a relatively large angle with the vertical, to allow for anticipated temperature changes and pavement loads. This created "a great horizontal thrust which resulted in the collapse of the rockers and the beams resting thereon."

• **What one engineer found**—Typical of the opinions expressed by the consultants is that of R. A. Moncrieff, of Charles T. Main:

". . . Temperature change was not . . . a major cause of failure. We are therefore led to believe that the rockers were placed out of line, inclined from a vertical position, at the time of erection.

"This belief is confirmed by an examination of the rockers after the collapse. After steel erection, the rockers were painted, and since that portion inside the receiving groove at the top end of the rocker was not easy to reach, the paint stopped on a horizontal line which was not at a right angle with the axis of the rocker and therefore provided visual evidence that the rockers were not placed in a vertical position at the time of erection, nor corrected for proper position prior to painting.

"Twenty-one of the rockers were examined, and the deviation from a vertical position varied up to 18 deg, with an average of about 10 deg. In other words, they were 'tipped' toward the center of the span, and when the weight of the bridge beams was placed on them, the rockers 'kicked' against the top of the bent in varying amounts, depending on the weight supported and the inclination of the rockers.

"The 'kick' of the rockers induced a thrust at the top of the supporting bent and initiated a series of changes which resulted in the collapse of the floorbeams. These changes were briefly:

"1. The thrust at the top of the beam induced a bending moment in the columns of the bent.

"2. The bending moment resulted in the deflection of the bent outward.

"3. The deflection of the bent increased the inclination of the rocker.

"4. With the increased inclination of the rocker, the thrust at the top increased and the series of changes (1, 2 and 3 above) was repeated. Finally, the increasing thrust and the bending

columns in the bent reached a point where the elastic limit of the steel bolts holding the bent upright was exceeded; the bolts stretched, the bent tipped outward, and the ends of the beams, having no further support, fell to the ground."

• **Steel man's view**—Leo I. Bruce, general sales manager of Lehigh, ridiculed the use of paint lines to measure the angle at which the rockers had been left by the erector.

"A hard-working southpaw painter," he said, "would make a very different angle with his brush than a right-handed easy-going workman. But even more important, the rockers of the adjacent span, which were among the group that were examined by the consultants, had been painted before those rockers were plumbed. After the failure, there was no way of associating the rockers with their beams.

"Actually, the steel could not have been erected if the rockers had been left at the angles claimed," Mr. Bruce contends. "The beams would have been too long to fit between the supports."

• **Contractor held liable**—William F. Callahan, commissioner of the Department of Public Works, reported the engineers' findings to the state Senate on June 9. He added: "it is therefore my intent to enforce the conditions of our contract with the general contractor (M. DeMatteo Construction Co., of Quincy, Mass.) for the furnishing of a satisfactory and acceptable completed project, at no added expense to the Commonwealth."

Cost of repairing the damage is estimated to be $25,000.

Construction feels steel strike pinch

The steel strike has hit construction hard.

Tonnagewise nearly 50% of the steel fabrication industry is shut down. American Bridge division of U. S. Steel, Bethlehem Steel Corp.'s fabrication division, and several other leading fabricators are strikebound.

The other 50% of the industry, by and large, has a pretty good inventory on hand, although a few fabricators will begin to feel the pinch on certain sections starting next week, according to a nationwide survey by ENGINEERING NEWS-RECORD.

For the duration of the strike, structural production will be lost at a rate of approximately 75,000 tons a week. This will be in addition to losses estimated at more than 90,000 tons resulting from the two previous shutdowns. Total losses in steel production through last week end amounted to nearly 6 million ingot tons, of which nearly 1.2 million will be lost directly to the construction industry.

• **Allotments cutback looms**—These losses have thrown allotment schedules into confusion.

The National Production Authority this week decided to maintain its ban on amusement-recreational construction at least until Oct. 1, perhaps for the rest of this year. The agency had been planning to lift its freeze on this type of construction July 1.

Cutbacks in allotments of steel for commercial and industrial building also were becoming imminent. NPA is going ahead with allotments for some 400 commercial projects. But it hedged on these third-quarter tickets, as it had already done with allotments for industrial jobs, with a warning that they might be changed.

The controllers were reluctant to shave back any allotments for construction in the quarter starting July 1. Like everyone else in Washington, they had hoped the steel strike would end quickly. But if it doesn't, all third-quarter allotments probably will have to be pared down.

An emergency steel direction issued by the National Production Authority requires currently operating steel plants, representing about 12.5% of the total steel output, to fill orders in a new "A" through "E" rating system as soon as possible. But Atomic Energy Commission projects are the only construction jobs that stand to benefit from it.

The steel trade magazine Iron Age pointed out last week that the agreement between the union and steel companies that military orders will be produced is not as easy as it sounds. There will be plenty of argument over what constitutes a military order. According to present indications there is no early promise of relief even to military construction from this source.

Here are a few results from a spot check of steel fabricators in important centers, that reflect general conditions throughout the steel fabrication industry:

• In the Boston area most steel fabricators have a sufficient supply of steel on hand to carry them for several weeks. Except for Bethlehem Steel's strikebound plant, no cutbacks have been reported. Some have run into trouble on a few sections. In the Hartford, Conn. area, Standard Structural Steel said, "We can't get what we planned on for certain jobs. However, we are working full and overtime here at present. I think we could keep going on some basis even if the strike lasts three months." City Iron Works and Berlin Construction Co. reported no pinch yet and working overtime.

• Fabricators in the New York area have enough stock on hand for another week or more. In the vicinity of Philadelphia and Wilmington, Del., spokesmen report that this week and next they will begin to enter the critical period and that a pinch can be expected. Fabricators in the Harrisburg, Pa. area are generally well off, but one of five companies will have to shut down in the next two weeks if the strike continues.

• In Baltimore, one of the biggest companies says it can go another week; another says it can keep open through the middle of July at least but fears stiff government restrictions will limit supply of steel "very materially" after the strike is over. A third fabricator puts it this way: If the strike lasts only a week or ten days it won't hurt us a bit. But he sees possibility of slowed down deliveries in the future. A fourth company says it is not too badly hurt and has a "right nice" inventory. Popular sizes of bars are being exhausted fast. Steel men make it plain they are being affected quite a bit even though they manage to stay open for some time.

• Pittsburgh, Pa. fabricators not closed by the strike will be continuing operations for several weeks before being hurt. Levinson Steel and Lockhard Iron and Steel are the only two warehouses open in the strike and they are parceling out available supplies in diminishing quantities.

• In Ohio, five fabricating firms in the Columbus area report projects have been delayed and some will remain incomplete until after the strike ends. One reported steel available at black market prices, but that operations would get more difficult and more costly as the strike drags on. All agreed sufficient steel is available to keep them operating until July 10. In the Cincinnati area, fabricators said they would begin to feel strike effects next week. Only one fabricator said the strike would have to last another 60 to 90 days before it would be shut down. Overtime work schedules have been cut back. In Cleveland one of the largest fabricators reported it had an inventory sufficient for the next three weeks, but there is some unbalance. Another said it would be able to fill its com-

A SMILE FROM BOTH SIDES IN STEEL TUSSLE—Ben Moreell (left) Jones & Laughlin Steel Corp., and Phil Murray, CIO Steelworkers president, chat during a recess in strike negotiations. (Wide World photo)

Steel strike . . .

mitments for the next two weeks, but by that time its inventory will either have become so badly unbalanced or completely depleted that operations will slow considerably.

• In Detroit, R. C. Mahon Co. expects to be pinched a little starting next week, but estimates it can continue for more than a month before closing down. Whitehead & Kales Co. has a sizeable inventory, is feeling no pinch, doesn't expect to feel effect for another week, and figures that its present stock would carry it for at least two months. J. L. Peters Co. believes it will not feel any strain for another month or more. In Milwaukee most steel fabricators will begin to suspend operations about July 1 if the strikes does not end. Though some firms are working as much as 50 to 53 hours a week, that cannot be cut back to stretch out the production, a spokesman for one fabricator said. He pointed out that customers know their steel is in the shops and expect that the firm will take care of them to the best of its ability and that means turning the steel out on schedules. A critical cement supply situation also threatens as the Universal Atlas Cement Co. Mill near Gary, Ind., was closed by the strike.

• Fabricators in the St. Louis area will begin to feel the pinch next week. In Indianapolis, Ind., fabricators are feeling the pinch but have enough stock to operate another week. In Kansas City, Mo., fabricators report they have steel to keep going for several weeks, but are feeling the pinch in certain sizes and qualities. Butles Manufacturing Co. reports stockpiles adequate and not worrying too much about shortages. Kansas City Structural Steel Co. is feeling "no pinch of consequences now."

• In Chicago, Bethlehem Steel Co.'s two fabrication plants are closed and American Bridge's plant at Gary is struck—its drafting rooms are being picketed and are virtually closed since engineers aren't permitted to cross picket lines. Fabricating plants that are strikebound have more material on hand than they need: the longer the strike continues, the more business big fabricators are apt to lose to smaller companies. Non-strikebound plants report sufficient working inventories of mill steel to permit normal operation for more than a month yet. Two large fabricators of reinforcing steel report they'll be able to make virtually no deliveries after July 1.

• In St. Paul, Minn., fabricaters report ample inventories. One fabricator said, "We can go about 45 days. We're still getting steel. Apparently there's a lot of it around the country, with inventories larger than originally thought to be." Crown Iron Works reports, "We haven't felt the pinch yet, but it's a cinch we will, even if the strike is settled tomorrow. We won't shut down for lack of one or two items and we have a pretty fair stock of steel on hand."

• In Louisville, Ky., six major fabricators said they were not feeling the pinch yet but in the next month, all fear they will have to close up shop or operate on a very limited basis. All expect to run out of some sizes next week or the following week.

• In Tennessee, Nashville's leading fabricators will have to close down in another three weeks if the strike does not end. Some plants will have to curtail operations possibly starting next week. Nashville Bridge Co. is reported already operating on a part-time basis and will be able to continue that way for another two weeks. It will then have to curtail operations further. McCann Steel Co. will have to shut down by the middle of July. Englert Engineering Co. has not felt the effects, but will if the strike continues for another week. Production will slow down, but operations will continue for another month. McMurray Structural Steel Co. said it can continue operations for about two months with its present stockpile. In Memphis, fabricators are not feeling the pinch yet, but expect to start feeling it next week. They will be able to get along comfortably for about a month. American Bridge Co.'s plant is strikebound.

• In Little Rock, Ark., the Arkansas Foundry Co. is reported to have supplies adequate for ordinary work and smaller jobs to last several weeks. In Jackson, Mississippi, fabricators believe it will be another week or two before they begin to be hurt by the strike.

• Fabricators in New Orleans are feeling the steel strike now and expect to be seriously hurt in one to two weeks. No layoffs have occurred yet and most fabricators say that the steel supply situation is so uncertain even without a strike that they are not in a position to talk of possible shutdowns until the picture is clarified. Jones and Laughlin, one of the biggest fabricators, reports that because of delays in the start of several projects, it is in a better position than most and does not expect to be seriously affected for another two months.

• In Dallas, Texas, fabricators agree that the effects will be serious starting next week. Some are already drawing up plans to cut their schedules. Mosher Steel Co. felt its first pinch last week. An official reports, "We were caught here with one-third of the steel for our customers in our yards and the other two-thirds in the struck mills. Unless we have steel coming in the next two weeks we will be in serious condition. Lofland Co., fabricators of reinforcing steel, has already felt the strike. In San Antonio, Alamo Iron Works "won't be hurt very much for two or three weeks from now." Campbell Steel Co. has enough on hand for three more weeks.

Colorado-Big Thompson touted

The $157-million Colorado-Big Thompson project this week will be formally dedicated to its task of drawing water under the Continental Divide from the sparsely-populated western slope of the Rocky Mountains to the irrigated farmlands and fast-growing, power-hungry cities of northeastern Colorado.

Coinciding with the Bureau of Reclamation's Golden Jubilee celebration, June 16 and 17, the Colorado-Big Thompson project dedication represents the fulfillment of a dream more than 50 years old. As early as 1889, the Colorado legislature appropriated money to investigate the practicability of transmountain diversions to aid the drought-harassed eastern slope.

Preliminary survey of the Colorado-Big Thompson project itself began in 1933 under local sponsorship. In August, 1935, the Bureau of Reclamation was allotted $150,000 by the Public Works Administration to make a new investigation, and in 1937 the project was authorized by Congress. Construction was started on the project in 1938.

Participating in the combined Colorado-Big Thompson dedication and Bureau of Reclamation Golden Jubilee celebration will be 31 engineers from 19 foreign governments who are in this country under the sponsorship of the Technical Cooperation Administration and the Mutual Security Agency.

• **Huge system**—When the last details are completed, Colorado-Big Thompson will include 10 reservoirs, 15 dams and 7 dikes, 24 tunnels, 11 canals, 3 closed conduits, 21 siphons, 3 pumping plants, 6 power plants, 8 penstocks and 821 circuit miles of transmission lines (ENR Dec. 11, 1947, p. 96; Sept. 16, 1948, p. 80). The reservoirs have an aggregate capacity of 984,975 acre-ft; the dams and dikes will include 23 million cu yd of earth and rock fill; the tunnels will have a combined length of 35 miles; and the canals will have a combined length of 93 miles.

Part of the cost of the project will be repaid without interest over a period of 40 years by the water users; and the remainder, with interest at 3%, will be repaid from the sale of power. In increased value of farm production alone, the project is expected to yield about $13 million annually, or more than a half billion dollars during the 40-year repayment period.

Area benefiting from the project extends from the foothills of the Rockies to the Nebraska border. It contains more than 700,000 acres of farmland along the upper South Platte river and its tributaries—embracing territory half the size of the state of Delaware.

• **The problem**—Despite numerous storage reservoirs, eastern slope farmers during late summer months have repeatedly run short of water, endangering alfalfa, grain, sugar beet, potato and other vegetable crops that were worth $45 million in 1950. Only a few miles to the west, the streams which form the headwaters of the Colorado river contained more than enough water—available to Colorado under the Compact of 1922—to keep irrigation systems working all summer every year.

But between the two stream systems—the upper Colorado river system on the western slope and the upper South Platte river system on the eastern slope—are 14,000 ft. peaks of the Continental Divide.

Colorado-Big Thompson's job is to gather the divertible waters on the headwaters of the Colorado river and to bring them through a tunnel under the Continental Divide to the eastern slope, where they can supplement the flows of the South Platte river and tributary streams.

• **World's longest tunnel driven**—Central feature of Colorado-Big Thompson is the Alva B. Adams tunnel, 9 ft 9 in. in diameter and extending 13.1 miles through the mountains forming the Continental Divide. According to the Bureau of Reclamation, it is the world's longest irrigation tunnel and reputedly the longest tunnel of any kind in the United States to be driven exclusively from only two portal headings. Eastern portal of the tunnel is 109 ft lower than the western portal.

Work on the tunnel began in the summer of 1940, when crews on each side of the mountains began driving toward each other. Biggest advance in a 24-hour period was 74 ft., which approached the world record for tunnel driving at that time. When the two crews met four years later, the two headings were within $\frac{3}{4}$ of an inch in grade and within $\frac{1}{16}$ of an inch in alignment.

Lining the tunnel with concrete required two years. First project water was transmitted through the Alva B. Adams tunnel in June, 1947. Besides its capacity for water diversion—550 cfs—the tunnel serves as a vehicle for a 69,000-volt submarine type power cable.

NEWS BRIEFS

• **New Penn pike section**—Ground will be broken within the next two months for the $50-million, 33-mi Delaware River extension of the Pennsylvania Turnpike—to connect eventually with the New Jersey Turnpike. T. J. Evans, turnpike commission secretary, said all that remains to be done is to complete financing arrangements, and reach agreement with New Jersey on a new $15-million bridge to connect the two super roads.

• **Halt work awaiting decision**—The Federal Power Commission has authorized the Virginia Electric and Power Company to suspend construction work on its $27-million hydroelectric project on the Roanoke River near Roanoke Rapids, N. C. The stoppage was authorized pending a U. S. Supreme Court decision on an appeal by the Interior Department and the Virginia REA associations from a previous decision upholding VEPCO's FPC license.

• **Incodel addenda**—The Supreme Court has appointed Kurt F. Pantzer of Indianapolis as a special master to consider a request by the City of New York for an increased diversion of Delaware River water for its use. The city seeks a modification of a 1931 Supreme Court decree.

• **Bridge advances**—The proposed $45-million bridge across the Mississippi River at New Orleans was brought a step nearer reality when Governor Kennon last week signed an enabling act authorizing the creation of bridge authorities for the construction of toll spans. Appointment of members to an authority being created jointly by New Orleans and Jefferson Parish began immediately. The governor urged the authority to proceed promptly with preparations for the bridge.

• **Displaced town**—Army Engineers are reported going ahead with a $46-million jet-bomber base in Portsmouth-Newington area of New Hampshire despite protests of residents. The Air Force contends that the site, which will take in the Portsmouth Municipal Airport and an estimated two-thirds of the town of Newington, was chosen after careful survey of the entire northeastern region.

• **St. Lawrence struggle**—The hotly disputed St. Lawrence Seaway bill was called up in the Senate last week with indications that long debate might prevent it from being voted upon at this session.

Engineer groups adopt a constitution

Representatives of 14 collective-bargaining groups of engineers, meeting in Chicago recently (May 30-June 1), adopted a constitution for their newly formed national organization. They named it: Engineers and Scientists of America (ESA).

Next move is ratification of the constitution and by-laws, which will be effectuated when a minimum of eight of the groups approve them.

This was the third exploratory conference of the groups to form a national organization of collective-bargaining engineers and scientists. The first one was held in Newark, N. J. in August 1951, and the second one in Chicago last February (ENR Mar. 6, 1952 p. 105).

The 14 groups—who sent 26 delegates to last week's conference—represent a total collective-bargaining membership of 15,000 engineers and scientists, plus 10,000 others who are eligible for membership.

• **Membership requirements**—According to its constitution, membership in ESA is restricted to non-supervisory engineering or scientific employee groups, meeting any one of five requirements:

1. Groups certified by the National Labor Relations Board as collective-bargaining units.
2. Homogeneous groups of civil-service engineering and scientific employees of governmental agencies who are precluded by law from becoming certified for collective-bargaining.
3. Employee groups predominantly professional as defined by the Labor Management Relations Act of 1947.
4. Groups of engineers or scientists that apply for NLRB certification within 120 days after conditional membership has been accepted by ESA.
5. Predominantly professional employee groups in transportation. This category includes, primarily, engineers and scientists employed by airline companies.

• **Objectives**—The primary objective of ESA, is the economic betterment of its members. It will also work for improving the educational qualifications—on a national level—of engineers and scientists.

It is estimated that 5 to 10% of the initial membership in ESA will be registered professional engineers.

(In an editorial comment on this movement in the March 13 issue of ENR, p. 19, the statement was made that most of the men represented at the Chicago conference were registered engineers. That statement should have said that most of the men were qualified for registration).

• **Interim officers**—Assuming that the constitution and by-laws will be ratified, ESA will hold its first national convention in California next February, probably in Los Angeles. Officers and directors elected to serve in the interim are:

President: Joseph Amann, Minneapolis Federation of Honeywell Engineers (MFHE), Minneapolis, Minn. Vice-president: John Taft, Engineers Association of Sperry Gyroscope Co., Great Neck, N. Y. Secretary: Orville Underwood (MFHE). Treasurer: Herman Week, Research and Engineering Professional Employees Association, Whiting, Ind. (Standard Oil of Indiana).

Permanent headquarters for ESA and a full time secretary, or editor of the organization's magazine (as yet unnamed) will not be selected until after the annual convention next spring.

Two unions still strike in California

Northern California's two-month long carpenters' strike ended two weeks ago when union members were granted a 21-cent-an-hour wage increase plus welfare benefits of 7½ cents.

The increase included the 15 cents that San Francisco Bay area carpenters had settled for a few days before, along with an extra 6 cents to erase a long-standing differential between Bay area carpenters and those in the larger area.

The 15 cents was retroactive to May 12—the 6 cents will go into effect next February, and the 7½ cents next March 1. The February increase will bring their hourly wage to $2.60.

• **Four settled, two doubtful**—Meanwhile, in Southern California, contractors negotiating new wage agreements with the six major building trades have reached settlements with four of the unions, but the other two have started scattered walkouts in an attempt to break the general pattern of 19 cents an hour.

The recalcitrant groups are the operating engineers and the reinforcing iron workers, asking raises of 26 to 29 cents.

• **Agreed**—Agreements for 19-cent hikes were reached—subject to membership ratification—with teamsters, cement finishers, laborers and carpenters. The first three negotiated jointly, while the carpenters, engineers and iron workers negotiated individually. Contractors are represented by AGC and Building Contractors Association.

In addition to the 19 cents, the carpenters got an additional 3 cents an hour "to eliminate a differential between carpenter rates and those of cement masons and reinforcing iron workers, long a cause of furious labor disturbances in the industry."

The carpenters have been getting $2.35 an hour. The other three unions that have settled have been getting rates ranging from $1.75 to $2.75.

The basic contract between unions and contractors, signed in 1950, doesn't expire until 1954, but it provided for wage reopening this year.

(*Continued on page 35*)

NLRB bans union hiring

F. H. McGraw and Co. has been ordered to discontinue preferential hiring in its labor contract with the International Union of Operating Engineers, AFL. The National Labor Relations Board ruling resulted from a complaint at the atomic energy project McGraw is constructing near Paducah, Ky.

The labor board applied the ban to all McGraw construction projects covered by a nationwide bargaining contract with the AFL union. The board reasoned that if it limited the remedy to Paducah, the practice might continue elsewhere.

A job applicant complained that he was told to get union clearance before he could have a foreman's position. Since Taft-Hartley does not apply to supervisory jobs, the board dismissed his particular complaint. But it ruled that the practice of hiring only AFL union members—on a recommendation from the IUOE local—was illegal.

Taft-Hartley permits compulsory union membership 30 days after hiring, but forbids the use of union membership as a job qualification.

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PROGRESSIVE BLAST: Eight holes are loaded in this Millington, N. J. operation of the North Jersey Quarry Company. ROCKMASTER® milli-second delays Nos. 0 to 7 are arranged progressively from right to left. The delay interval between each is approximately 25 milli-seconds, making a total delay spread of 150 milli-seconds. Control is excellent, fragmentation good. Characteristically the rock pile slopes toward the area of most delay. Confinement of gases (and consequent elimination of air blast) is practically complete. This is an excellent example of progressive action at its best.

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Government employees least safe, says speaker at safety conference

State and local governments are among the worst offenders in providing for the safety of their employees. This is the charge of a high official of the National Safety Council, after a diligent survey.

Speaking before the recent president's conference on industrial safety, Milton M. Bowman, general director of NSC's public employees section, implied that if you value your life, it's wise not to take a job working for a state or local government, especially on construction, road building and maintenance projects.

Bowman said that the men and women who work for most of the municipalities of this country—as well as most of the state highway departments—are working under conditions as hazardous as those prevailing in private industry 25 to 50 years ago.

By far the largest group of public employees work for the federal government, nearly two and one-quarter million persons. Schools employ one and three-quarter million and municipalities, more than a million more. Of the 745,000 state employees, many are employed on highway work. While federal employees are rapidly coming under the influence of the accident prevention program of the federal safety council, Mr. Bowman estimated that of the six and one-half million public employees in the U. S., not more than a million and a half are subject to the kind of accident control program which the employees of private business enjoy.

• **Study**—Referring to a questionaire study of safety activities of some 400 municipalities in 1951, Mr. Bowman revealed that 62 percent frankly admitted they had no formal safety program whatever and only nine to ten percent claimed qualified safety engineers, training programs or periodic safety inspections. He pointed out that a vast number of cities conduct effective traffic safety programs for their residents but do nothing at all about safety for their own employees.

Not one state in the country has an overall safety program for its employees that has been in effect long enough to show significant results. Because state highway departments are among the largest employers and contend with the most serious hazards, the NSC conducted a survey to find out what was going on safetywise in state highways departments. They got only 18 accident frequency rates and six severity figures back from the forty-eight states.

Safety conference

The third president's conference on Industrial Safety was held this month in Washington, D. C.

The conference brought together 1,200 representatives of government, management, labor, and leaders in civic and educational fields.

The keynote of the conference was the importance of conserving manpower for defense production through fully co-ordinated industrial safety programs.

Bowman commented: "Seven states replied that no standard injury rates were calculated the remaining departments said they either had no safety program, or they did not reply. Not one of the state highway departments known to have effective accident prevention in process failed to respond, so that our conclusions do not do any injustice that we are aware of. The lowest frequency obtained by us in our inquiry was 7.86 and the highest over 60.

Bowman called it a disgraceful "spectacle" for city or state administrations to try enforcing minimum standards of safety conduct on the part of employers while failing to do so itself.

HUNTER P. WHARTON, pointed to a successful safety plan in western Pennsylvania.

• **Contrast**—The safety meetings of the Western Pennsylvania Constructors Association were cited by Hunter P. Wharton, operation engineers union executive, ASN an illustration of how a successful employer-union safety program works.

The Pennsylvania group has asked labor to take part in the meetings and on many occasions a labor representative has been the principal speaker. On others, the speakers have all been from the ranks of the employees.

He praised the spirit of mutual cooperation and sincerity displayed by labor and management that developed outstanding, successful safety meetings on the construction sites of the new Mellon-US Steel and General Motors buildings in Pittsburgh.

Emphasizing that the "cost" of accidents means something different to management and to the injured worker, Mr. Wharton said too much attention has been focused on economic costs in trying to sell accident prevention to workers. That kind of approach, he warned, puts humanitarian considerations secondary and affects the worker's attitude toward the sincerity of the employer.

Wharton advocated sincerity of purpose to achieve the aims of both labor and management: lower the cost to management, save the lives of workers, and lesson the suffering of the workers and their families.

• **Things can be better**—North Carolina, Ohio, Connecticut, California, Minnesota and a few other states have proved that enormous savings in manhours and money, as well as in human suffering, can be made under state auspices.

Nevertheless some speakers pointed out that not one of these cities had reached the level of hazard control which has become commonplace in the major private industries of the country.

It was urged that every city government of moderate size create within its framework an advisory safety committee, and called for greater participation by all citizens in the work of various safety organizations throughout the country.

It was said that if big business can get results in accident prevention, there is "no inherent weakness in large municipal units of government, nor in state highway departments, nor in any other large public employee organization which denies them the power to do the same thing."

Problems of a billion-dollar contract—I

How 45,000 H-bomb workers live and travel

THE ATOMIC ENERGY COMMISSION'S Savannah River project has been drawing in southeastern construction men for a year and a half now. And the men are still coming. They'll number 45,000 at peak employment this fall.

One of the biggest working forces ever assembled for a single job, these men are building a plant that will make hydrogen bomb and A-bomb materials. Plant cost now is estimated at a record $1.2 billion.

If you contrast the peak construction employment figure with an expected operating force of 7,200—then realize that none of these people can dwell in the Atomic Energy Commission's 315-square mile reservation—the magnitude of one of the current problems becomes plain. A problem separate from those relating to the building of mysterious structures, it is that of providing housing for a major population increase, most of it temporary, and of moving the men quickly to and from their working areas.

The Atomic Energy Commission picked the project site with this problem in mind, thereby partly solving it. The site was thinly populated, yet near populous centers. Thus there would be a minimum of relocating dispossessed families, and the nearby cities could absorb both the early construction workers and the plant's permanent force. Still, transportation had to be provided for all workers, and housing for at least part of them.

Adequate transportation facilities meant ample roads for private automobiles. Housing meant barracks and trailer villages that could pay for themselves in a three-year construction period. Other community service problems, like schooling, also would have to be solved.

• **du Pont is contractor**—Sharing the problem with the Atomic Energy Commission is E. I. du Pont de Nemours Co., the cost-plus-$1 fee construction contractor, which also is designing and will operate the plant. du Pont's construction division is one of America's most competent industrial builders. It has built many company plants and, since 1941, has built several government plants, including the Atomic Energy Commission plant at Richland, Wash., now operated for the commission by General Electric Company.

The division is best known in construction circles for its leadership in safety—an extension of the company's industrial safety program. But it also has adapted industrial management and labor relations techniques to construction. (ENGINEERING NEWS-RECORD will discuss phases of the industrial management procedures in an article to be published next week.)

One of the first things du Pont construction division officials did, late in 1950 when Savannah River was announced, was to discuss employment conditions with responsible officials in the area.

• **Commuting at 50 mph**—The prime objective was relief from traffic congestion. Because men would have to travel at least 20 miles each way, they wanted traffic and parking facilities that would involve no delay. Traffic should be able to move at 50 mph.

With this in view, the first major road project was a 4-lane dual highway that goes out from North Augusta,

SAVANNAH RIVER PROJECT—ATOMIC ENERGY COMMISSION

Location—20 miles southeast of Augusta, Ga., on South Carolina side of the Savannah River.

Size—315 square miles fronting 31 miles on the Savannah River.

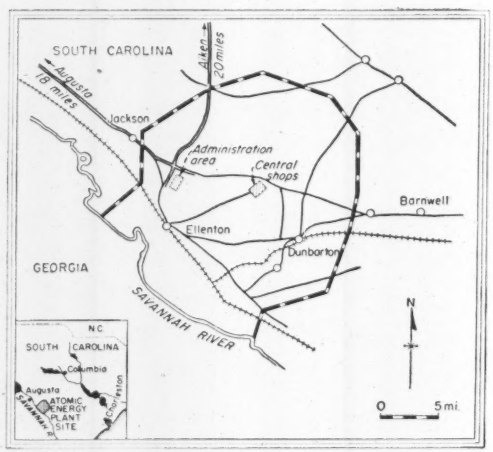
Topography—Rolling, two-thirds wooded.

Principal communities—Ellenton (pop. 600) and Dunbarton (pop. 231). Land acquisition—Residents' properties were purchased and in most cases structures have been moved to sites off the AEC reservation. The residents of Ellenton, Dunbarton, 5 villages and many farms, numbered 6,000. Acquisition of 2,300 pieces of real estate is substantially complete.

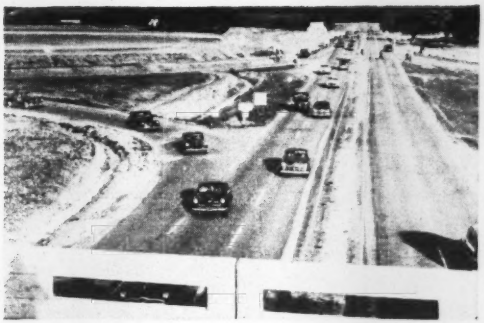
How peak construction force compares—Savannah River (AEC) 45,000; Oak Ridge Tenn. (AEC) 46,600 men; Panama Canal, 45,000; Tennessee Valley Authority, 43,000.

Construction requirements:

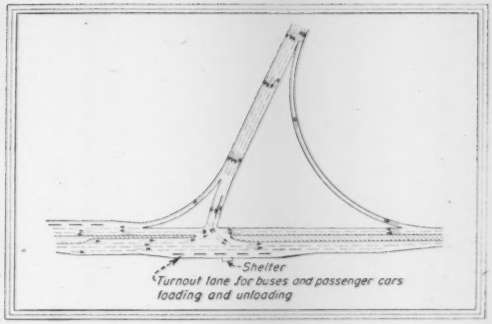
Lumber	75 million board ft.
Structural Steel	25,000 tons
Reinforcing Steel	85,000 tons
Excavation	20 million cu yd.
Concrete	1.25 million cu yd.
Concrete plants	6
Vehicles and const. equipment	6,300
No. of purchase orders	95,000
No. of drawings	2 million
Underground water lines	85 miles
Electric transmission lines	95 miles
New railroads	66 miles
No. buildings	250



SAVANNAH RIVER PROJECT covers 315 square miles. Construction is taking place at nine principal sites.



DUAL HIGHWAYS enable construction workers to make their long trips to and from homes in minimum time.



TWO-LANE ROADS are being rebuilt at intersections to eliminate bottlenecks. Here is a typical improvement.

S. C., into the heart of the AEC reservation—a vital connection with the biggest nearby city, Augusta, Ga. (1950 pop. 72,000). Highway work began in March, 1951 and was finished in August. Now a similar road is being built to serve Aiken (pop. 6,600).

There is a cloverleaf grade separator at the intersection of these two arteries, which are fed by a network of roads from major-activity areas. As a result of continuing traffic studies du Pont is eliminating bottlenecks in the feeder system, primarily by intersection improvements that would be a credit to any big-city traffic program.

Total mileage of new and permanent highway construction on the project to date consists of 90 miles of 2-lane highway and 13 miles of 4-lane. Construction forces also have reconditioned and surfaced more than 100 miles of dirt road for haulage roads. Moreover about 110 existing miles are a part of the permanent project highway system.

• **Money for state roads**—State construction is performed under the defense access roads program, wherein the state handles the work, which is paid for by 100% federal funds. Request for the work is initiated by AEC; the U. S. Bureau of Public Roads takes care of the federal procedures.

One other important highway program will be required. A by-pass route, including 12 or 13 miles of new construction will be necessary when the reservation is closed to through traffic. So far $4,000,000 has been appropriated for state work in connection with the Savannah River project.

• **Traffic volume**—Actually the state's construction objective is a simple one—to handle large volumes of traffic on two arteries. When the peak work force is reached, 4,000 cars are expected to move toward Augusta and 2,700 toward Aiken when a shift leaves the plant. At present, 1,500 cars use the Augusta road during the peak hour, with 34 cars per minute moving during the high 20 minutes. On the 2-lane Aiken road the peak-hour volume at the project boundary now is 1,300.

Inside the reservation, all kinds of traffic factors must be integrated. These include material-truck movements during the working day as well as personnel movements at shift changes. The shift changes are most significant, however.

• **Intersection improvements**—As a result of in-plant traffic studies, most of the intersections and junctions of two-lane roads have been modified. Improvements include deceleration lanes for right and left turns, long-radius turnouts and acceleration lanes (see typical illustration).

The town of Ellenton (now moved) posed a traffic problem during the first year. East-west by-pass roads were built on both sides of the town. Throughout the reservation traffic lights, mostly flashing signals, are used where needed and train-actuated signals guard railroad crossings. A further traffic safety feature is the construction of turnouts and shelters at designated auto and bus pick-up points.

• **Bus service**—At first it was thought that private cars would carry all passengers. But soon bus operators from various localities (some more than 100 miles away) began bringing loads of construction workers.

• **Traffic safety**—Bus operators, as well as individual drivers, are brought into the overall safety picture. Individual drivers discuss traffic and other safety at their "tool-box" meetings—short weekly sessions with their foremen. The du Pont safety supervisor issues traffic regulations to the bus operators and invites them to attend monthly traffic safety meetings, where management asks, "What can we do to help you?"

Suggestions for some of the intersection improvements have come out of these meetings, and a bus passenger transfer system has been worked out. Another result has been special parking lots for the buses.

• **Parking**—Parking lot layout embodies safety features, too. Car access and egress is from one side, while passengers enter and leave from the other. A 10-foot walkway separates the front of angle-parked cars in each double row, so passengers do not have to cross roadways. Covered time-clock alleys are located at the passenger-exit points.

Bus parking zones are located so that passengers walk directly to clock alleys without crossing traffic. In all there are 30 lots (500-1000 cars each) serving nine major work areas. Many of these are temporary for the duration of construction only.

• **Housing the workers**—"Duration of construction" is a significant expression in more ways than one around the reservation. The fact that the construction force exceeds the eventual operating force by almost 40,000 means that a large number of immigrant people will live in the area only during the period of construction.

Recognizing a housing responsibility but considering it unnecessary to go into the "government town" business (nearby cities can expand and absorb the permanent force), AEC and du Pont developed an unusual kind of contract designed to provide temporary housing.

Contractors agree to furnish and operate the housing; the government guarantees 90% to 100% full rental for a specified period, the rentals being

BARRACKS and trailer towns, with AEC-guaranteed rent, are taking care of temporary population excess. This is at Williston.

SCHOOLS, both temporary and permanent, are being built to meet the growth. This one at Jackson was the first.

sufficient to cover the contractors' investment.

Two types of housing—trailer villages and barracks camps—have been obtained on this basis. Contractor for the barracks is Lyles and Lang Const. Co., Columbia, S. C. Three 1,500-man barracks groups have been built at Barnwell, Williston and Allendale, on sites acquired by the contractor. Plant officials believe these barracks extend the labor recruiting radius by 100 to 150 miles, because men can stay near the job and go home weekends.

For $8.25 a week a man gets half of a 12x12 ft room, two linen changes, and maid service. Barracks groups include a canteen, a barber shop and a cafeteria. Recreation facilities are being planned.

As soon as a room is ready for occupancy the contractor begins to receive rent for it—either from the man who occupies it, or from AEC if it isn't occupied.

Trailers are being set up in groups of 500 to 1,000, in or near surrounding towns and communities. The contractor, John A. Robbins Co., Inc., Philadelphia, buys trailers of a specified design, transports them to sites he has acquired, removes the temporary wheels and mounts the trailers on prepared foundations.

Rental is $82.50 a month. This includes furniture, heat, water, electricity and maintenance of both the trailer and the grounds. Trailers have two rooms, in which four people can live. The rent was established by bids from contractors desiring to obtain the trailer-housing contract.

The first group of trailers—1,000—is in Augusta. The second—1,000—is in Barnwell. By fall there will be 4,000 trailers in several towns.

Occupancy in barracks began in March and in trailers in April, when construction employment was approaching 30,000.

• **How cities absorbed workers**—AEC representatives are satisfied that this new housing is timely. Surrounding cities (as well as numerous independent trailer villages) had successfully absorbed 15,000 to 20,000 immigrant workers by February. There were 400 available apartments and rooms listed by the du Pont employment office at that time.

Although relocation of the 6,000 people displaced from the reservation primarily is the concern of the individuals, the AEC and du Pont have certain responsibilities—mostly in connection with house-moving. (Incidentally, the former residents have priority for jobs in the new plant.)

Property owners' ground and improvements were acquired by the government, then improvements were offered to their previous owners at salvage prices, provided the owners would remove them. Home-moving outfits from as far away as Texas and Colorado did a big business in recent months, using I-beam trailers. Most of the houses were moved to new sites just outside the reservation. In fact, two towns, New Ellenton and Jackson, have burgeoned with the houses. Deadline for house removal from Ellenton was March 1. Other houses in the reservation were out by June 1.

• **Handling house traffic**—Management's interest in house-moving lay in its effect on traffic. Each house movement was cleared with the project patrol and a du Pont scheduling engineer. They allotted a time route, provide an escort and notified other departments affected.

Moves were scheduled during working hours, and on Sundays, when road traffic was lightest. If traffic began to pile up behind a house, the escort directed it to pull over into the nearest available wide place in the road.

Routes were selected where obstructions were fewest (a few old bridges had been widened, or had their guard-rails lowered with house-moving in mind). In most cases, a few road signs had to be removed and replaced by plant maintenance forces. Power and telephone lines also had to be adjusted. And intersection blinker lights got in the way. To care for this difficulty, blinker signals were suspended on pulleys from high catenaries. When a house went through, workmen raised the lights as high as they would go.

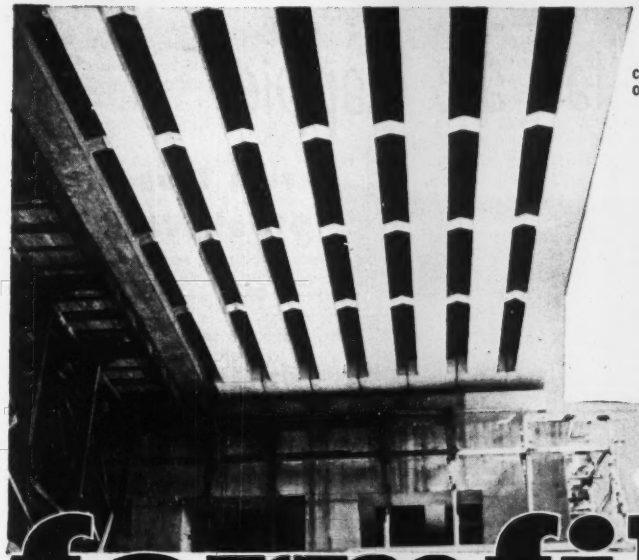
• **Community relations**—Cooperation with house-moving is about as far as physical AEC work goes beyond building and operating an industrial plant. But AEC has other community responsibilities:

1. Helping residents to know the integral part that the plant inevitably takes in community life.

2. Assisting growing communities in their efforts to keep up with requirements for public services.

The first objective is reached through a variety of educational measures. Plant officials give factual talks to civic groups. Employees take home pamphlets about AEC and du Pont policies. Employees also get into community activities. Newspapers run a variety of information about management activities.

Public services like schools and water and sewage works obviously



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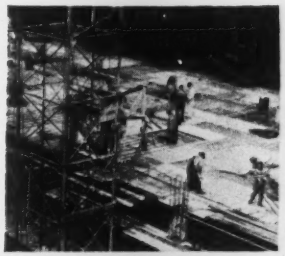

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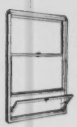

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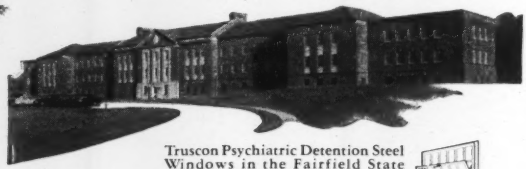
Kling & Frost, *Architects.*
Joseph Bucheit & Sons, *Contractor.*



Truscon Psychiatric Detention Steel Windows in the Fairfield State Hospital, Newton, Connecticut.
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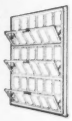

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must be provided for the worker influx. Sooner or later AEC gets into the towns' problems along these lines because the towns can't give full service quickly with their limited resources.

Once a town has reached its bonded debt limitation it has recourse to federal funds, under defense laws. At present, the Housing and Home Finance Administration has money-grant applications from seven municipalities. For water and sewage works the pattern seems to go this way: There is money for new water supplies and sewers, but not enough for water and sewage treatment.

When an application for a grant is originated, the AEC comes into the picture, checking requirements and certifying the need for the facilities to be bought. HHFA handles the grant through local agencies, much as the Bureau of Public Roads handles road grants through the South Carolina State Highway Department.

Schools receive assistance from AEC in two ways. AEC supplies local school districts with studies of trends in school population, and it certifies the need for the schools, again to HHFA.

Recently completed, under construction or being planned are 180 temporary classrooms and 162 permanent classrooms. The former cover the excess population during the AEC construction period. The latter cover the permanent population increase.

First school to be completed (March 1952) is at Jackson, where the majority of persons displaced from Ellenton have moved.

• **Key personnel** – Responsible for Atomic Energy Commission activities at Savannah River Project is Curtis A. Nelson, manager. Robert Blair is deputy manager.

Robert K. Mason is field project manager and Russell C. Stanton is direct assistant to the field project manager for construction, E. I. du Pont de Nemours & Co., Inc. (How Mr. Mason keeps daily tab on progress throughout this $1.2 billion construction job will be told next week.)

Spare stringers keep bridge in service during repair

Keeping the international railroad bridge at Laredo, Texas open during the daylight hours was a condition of a stringer-repair job completed recently.

Each of 21 pairs of stringers had to be renovated. Here is the working schedule:

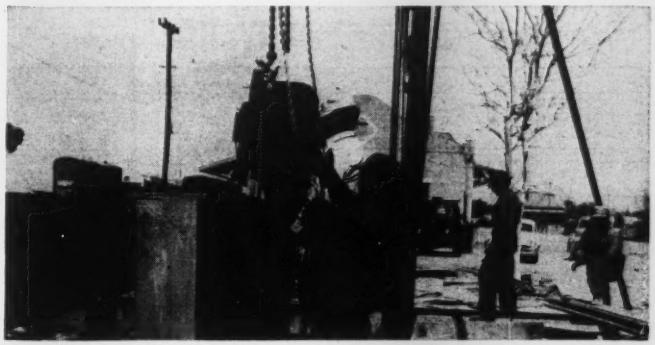
1. Between 8:00 p.m. and 4:00 a.m. a pair of old stringers was removed and replaced by a renovated pair.
2. During the day the old pair was renovated to become the replacement in the adjacent panel that night.

Key to accomplishment of this program was a pair of all-new stringers that went into the first gap opened.

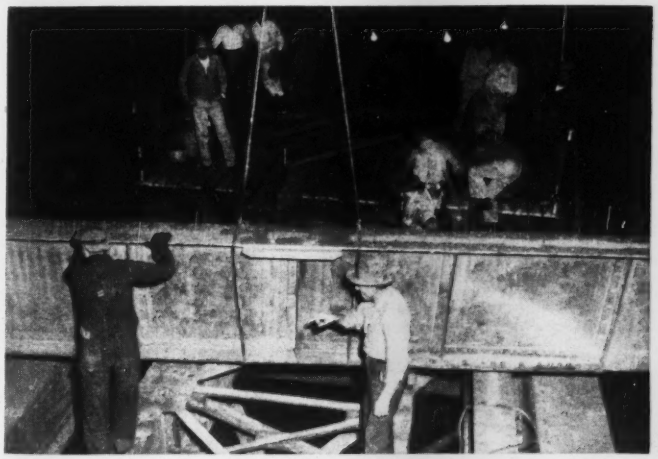
In addition, new gusset plates were installed for each bracing system and about 30% of the bracing angles were replaced. Renovation on the stringers included descaling, sand blasting, installing new cover plates and painting. All connections were re-riveted.

A flatcar-mounted crane moved onto the bridge each evening, to remove the rail, ties, handrail and miscellaneous hardware. Then re-worked stringers were placed on the floorbeams outside the old stringers. The bracing system was removed, old stringers were taken out one at a time, and the renovated stringers were slid sideways, inward to position. By 4:00 a.m. the bracing system was riveted; ties, rails and other decking pieces were replaced.

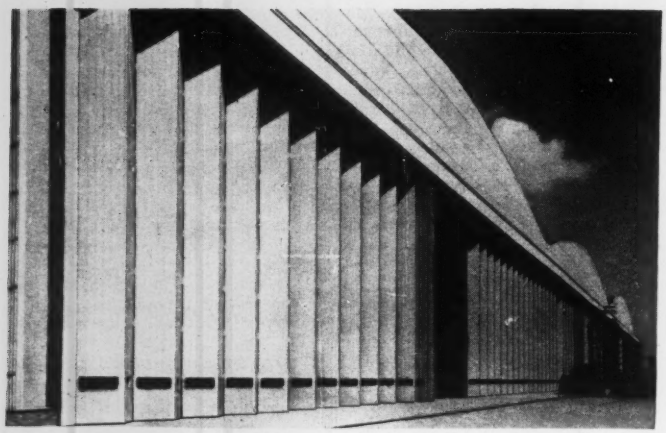
Reworking on the stringers took place in a yard near the U. S. end of the bridge. Two tools, a job-made jib crane and a special production riveter helped speed daytime work. The latter was a jam-type rivet hammer mounted on a yoke (see photo). The writer's firm, as contractor, was able to save $50,000 for the Texas-Mexican Ry Co. by adoption of these methods.—A. B. Cady, Jr., Peterson Const. Co., Inc., *Houston, Texas.*



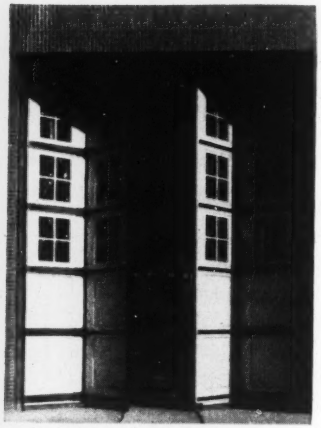
ONE DAY'S WORK—In yard at Texas end of bridge two old stringers are descaled and sandblasted. New cover plates and gussets are riveted on, and the whole is painted.



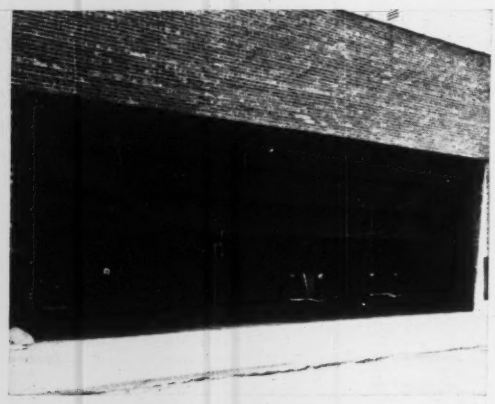
ONE NIGHT'S WORK—Renovated stringer will be set on floorbeams in space to left of workmen. Its mate already rests in other space (right, with wire rope on it). Old stringer assembly will be removed, renovated stringers will be sidled to place and connected.



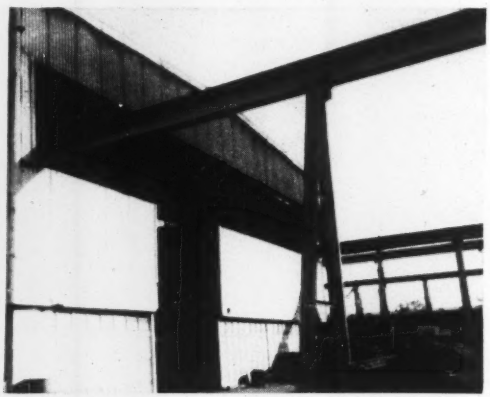
FOLDING HORIZONTAL SLIDING door for hangar requires only two top guide channels, simplifying design of structural member spanning opening.



SWING DOORS like this four-fold type need no extra clear space at sides or top.



VERTICAL SLIDING doors must have clear space at top or bottom to accommodate panels in closed position.



TOP-HINGED crane doors can provide openings up to 18 ft deep. Door lightness simplifies design of structural members.

How to cope with special-purpose doors

Harold B. Pollock
Engineer
The Peelle Co., New York, N. Y.

LARGE individually designed doors pose more of a problem for building designers than just the one of allowing the right size opening for the door contractor. Such doors, distinguished from those made on a production basis, require careful design of the main structure to support loads and to allow space for the open door and its controls.

Proper consideration of these problems requires that the building designer be familiar with the leading types of so-called "special" doors. Manufacturers in this field classify them as follows:

a) Horizontal sliding—door leaves, equipped with bearing-type bottom wheels, ride rails in the floor while top rollers operate in overhead guides

b) Vertical sliding—one or more leaves moves up, down or both ways in guideways attached to the jambs of openings

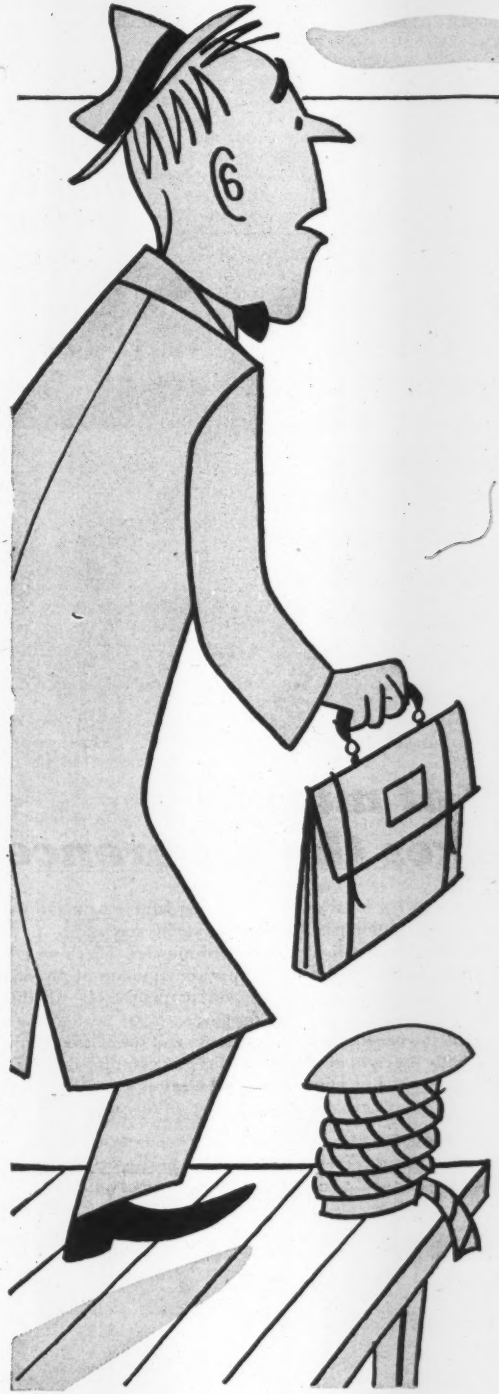
c) Swing—leaves of solid or vertical-split section swing on hinges supported by the jambs, and

d) Top or horizontal hinge—same as (c) except hinge is horizontal and usually supported by bottom portion of structural member spanning the opening.

• **Horizontal sliding**—Two variations of this type are popular today, telescoping and folding (see drawing on next page).

The first named, having greatest application in airplane hangars, is normally center parting, with from six to 20 leaves. They are composed of wood, steel or both materials combined. Open doors are stacked in pockets at each end.

The telescoping door is most frequently driven by two motors located in the pocket. They drive an endless



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chain attached to tops of center leaves. The remaining leaves are moved by a series of interconnecting cables attached to the powered leaf and arranged so that all leaves arrive at open or closed position simultaneously. Motor size ranges from 1 to 10 hp. Travel speed of leaves varies from 45 to 160 fpm. Leaves can be 5 to 12 in. thick. They should be spaced about 2 in. apart.

Wind loads are computed at 20 to 30 psf lateral pressure. (This figure is used for all exterior door types—only the means of lateral support differ.) In the case of horizontal sliding doors, the leaves themselves are braced adequately by the manufacturer, while the building designer must take care of lateral loads transmitted to the top guide channels.

The weight of the leaves must be taken by the footings below the rails. A good average for telescoping units is 20 psf of panel surface.

Because so much steel is used in the top guidways, very significant additional loads must be supported by the structural framework member. One-half-inch thick 6 x 4 angles are often used for the guideways, so 16 lb per ft should be multiplied by the various angle lengths (see drawing) to obtain rough estimates.

• **Folding doors**—It is obvious that the wider the openings become, the more tracks and guides are necessary, and consequently greater steel loads have to be supported across the opening. With clear opening requirements now sometimes as much as 70 ft high and 600 ft wide, design of the structural framework member becomes an acute problem. Folding-type sliding doors may be the solution.

In the U.S., folding doors have been used almost exclusively in building interiors, mainly as dividing walls in multi-use areas, such as cafeterias and gymnasiums. Europeans, however, have used them successfully for hangar doors. A prime example is the installation at Filton, England, housing the giant Brabazon plane.

The folding door is made up of a series of leaves hinged together in pairs. Leaves are arranged to fold outwards and when closed (door shut) are held by automatic folding stays. Driving motors are usually located in mullions adjacent to the center line of opening. Cables extend from the mullions to hangar side. When opening, the mullions are drawn toward the side and sweep the leaves along. Again, travel speed can vary from 45 to 160 fpm.

The most significant advantage of folding over telescoping types is that only two guide channels and bottom rails are required, regardless of width. Steel is conserved in two ways: Less required for guide channels and rails and less for supporting member at top. And since wind loading is applied to leaves that are always in partly folded position, more lateral stiffness is obtained due to triangular configuration. Panel thickness is consequently reduced so that 10 psf may be used in estimating footing loads.

• **Vertical sliding doors**—This type finds wide application where space above or below is available for the leaves to move into. The recent trend toward dual use of floor areas in buildings has motivated installation in churches, schools and hotels, where they often disappear completely from sight.

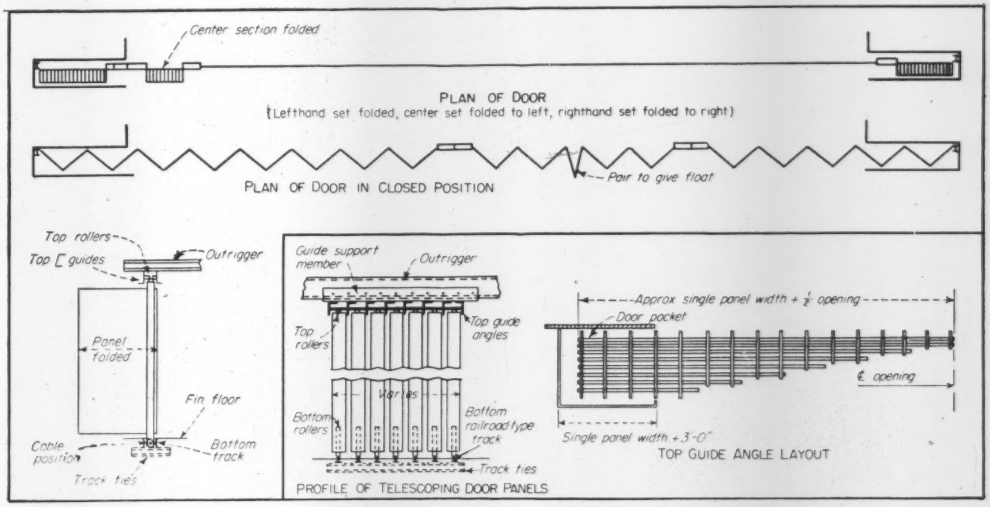
They have been favored in many industrial plants where huge equipment must be removed occasionally. Also, in many small commercial buildings, especially where much trucking is the rule, vertical sliding doors are useful. In both these instances, they may aid architecturally in accenting the horizontality of a structure.

Either manual or power controls are provided and may be located adjacent to the door or at a distance. Leaves can travel from 45 to 60 fpm. About 1½ ft in excess of leaf height is needed for leaves to slide into. Thus, the more leaves, the less space is required above or below.

Doors are normally counterweighted. About 15 in. of clear space back of the jamb line is needed. On the idler side 4 in. will do.

Vertical sliding doors may be used in openings up to 35 ft high and 100 ft wide. A single section door, including counterweight and guide steel, averages 40 psf. If more panels are used, less counterweight is required. Vertical loads are transmitted to the door guides and then by column action to the footings. Lateral support is furnished by the jamb steel and building walls.

• **Swing doors**—Where there is inadequate space above or to the sides or bottom to accommodate sliding doors, swing types are advantageous. They



TYPICAL INSTALLATION of folding horizontal sliding door. Inset at lower right shows telescoping type.

are popular in firehouses, where width-of-building clearance is essential, and at railway entrances where doors are interlocked with the signal system.

Common variations are single-swing (solid leaf with vertical hinge on one jamb), double-swing (hinges on both jambs), two-fold (hinge on one jamb and another between folds or leaves), and four-fold (hinges on both jambs and between each pair of folds).

It is obvious that a greater number of folds requires less time for opening and a smaller radius of swing. Tighter swings make for more safety, during opening particularly, and allow material to be placed closer to the door.

A common four-fold door is 17 ft wide and 22 ft high. Up to 25 x 25 ft is normal maximum. Average load, wholly supported on jamb steel and including controls and hinges, can be taken at 12 psf.

• **Horizontal hinge**—Crimeway entrances to buildings employ a top-hinged unit effectively. Widths of more than 100 ft at or near top of the building can be opened to depths of 4 to 18 ft. Of course, a section beneath must be opened to allow the load to pass through.

Top-hinged swing doors are constructed of light materials, often a combination of structural steel and exterior grade plywood on both sides. A leaf weight of 5 psf is a good average. A motor-driven system is generally geared to swing the panel through its arc in about 1 min.

Most often a horizontal sliding door is employed beneath the crane door. Top guides for the former are contained in the bottom chord of the swing panel. Therefore, slide doors must be opened completely before the other can swing up.

• **Sound insulation**—All door types can be insulated to reduce sound transmission. In one common method, applicable for doors 2 to 6 in. thick, an acoustic material is sandwiched between thin steel plates. In another, plywood panels are braced with wood joists (that extend only partly through the interior) and are held by steel channels at the edges. All parts are cushioned from one another by rubber pads.

In a more complicated system, two steel doors about 3 ft apart press up against the building walls on each side of the opening when the air between is evacuated. Sound insulation is obtained by means of the air-tight seal between doors and wall, not because of the low-pressure air space. When the vacuum pump stops, doors fall slightly away from the wall and can be slid to one side.

Thick concrete doors such as for jet engine test cells serve double duty: they are explosion-proof and furnish a good degree of sound insulation.

• **Help from manufacturers**—The generalized information in this article can be supplemented with detailed aid on individual problems (at no cost and without obligation) from all producers in the special-purpose door field. The importance of considering these doors in the early planning stage cannot be emphasized too strongly; the load and space requirements cited illustrate clearly how design of the main structure is influenced.

Construction contracts are normally let by the general contractor under competitive bidding. In the case of doors for freight elevator hatches it is often more economical to let separate contracts for the doors and the elevator equipment, each to the appropriate specialist.

How to save deteriorated bolts anchored in good concrete

A procedure that conserves metal, time and money was used on a recent repair job at the Navy's Leonardo, N. J. pier facilities.

It was found necessary to replace worn railroad track secured to the concrete piers by long metal bolts whose heads were embedded in the concrete. Investigation showed that many of the bolts were seriously corroded at their exposed threaded ends.

To chip out and replace the bolts would have been a long and expensive job. Instead, Navy civil engineers and the contractor, Charles F. Vachris, Inc. of Brooklyn, employed end-welded studs.

Method—First, workers stripped the rails from the piers and used pneumatic chip hammers to remove existing grout.

Then acetylene torches were utilized to cut away enough of the bolts to reach sound metal. Grinding the bolt ends followed.

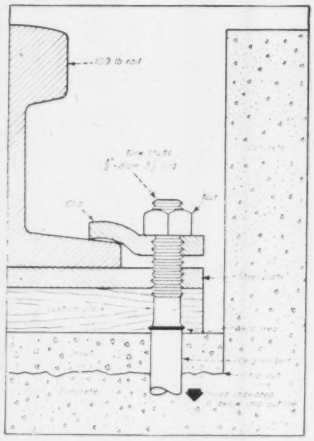
Then threaded studs, ¾-in. dia and 3½ in. long, were end-welded to the bolts with a semi-automatic electric stud welding gun. Bolts were thus quickly extended to their original lengths.

Double porcelain ferrules are required when using the stud-welding gun for this purpose. The ferrules' meshing saw teeth provide maximum shielding and are self-centering. A pair of locking pliers holds the bottom ferrule in position. The welding gun's ground cable is permanently attached to the pliers, which don't burn because pieces of copper bus are inserted in the jaws.

The average rate of stud application was 500 per day with two guns on the Leonardo job.

Tests made by the Navy show that the butt welds can take 18,000 to 19,000 lb of tensile load before they fracture.

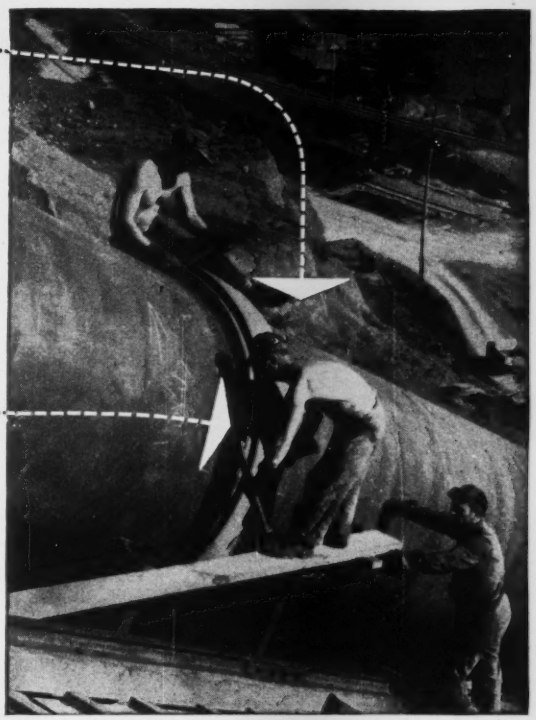
Information and illustrations for this article were supplied by the Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, Ohio.



END-WELDED STUDS replace corroded portions of old bolts, saving sound sections. Using two guns, a daily rate of 500 studs was achieved on this job.

from penstocks to water mains . . .

Dresser Couplings absorb pipe movement, prevent built-up stresses, speed construction

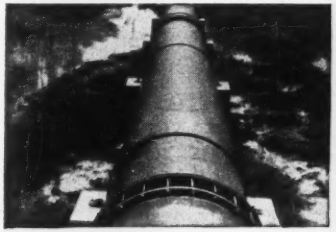


On either exposed or buried lines, from 3/8" to 72" diameter or larger, your best protection against vibration or movement stresses is a Dresser Coupling. Each of these "flexible-tight" joints takes up to 3/8" expansion-contraction movement . . . up to 4° deflection . . . cushions your line at every joint. Specially compounded rubber gaskets soak up vibration like a sponge.

Installation of Dresser Couplings is simplicity itself. Any workman can install them; the only tool needed is a wrench. And fast? On a typical 48" water line, 40 lengths of pipe were laid in one 8-hour day using a two-man joining crew.

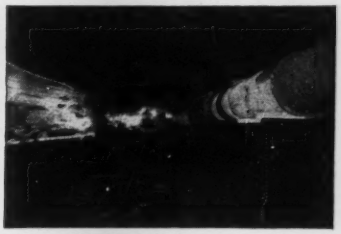
Performance on half a million miles of pipe proves Dresser dependability.

75" penstock of the British Columbia Electric Co. One of three installed at Bridge River, using Dresser Couplings specially designed for the job. With Dressers, construction time was cut from months to weeks, due to simplicity of installation. And penstocks have remained bottle-tight under very high pressures, despite severe weather conditions.



Over swamps and marshy ground, where earth movement must be considered, Dresser Couplings keep Savannah's, new 14-mile, 42" water supply artery completely tight.

In busy streets of Stoneham, Mass., simplicity and ease of installing Dresser Couplings gets the job finished sooner. Dressers absorb traffic vibrations.



Under New York Harbor, construction of the Brooklyn Battery tunnel was simplified by using Dresser Couplings to join air and water supply lines.

DRESSER

"FLEXIBLE-TIGHT"

COUPLINGS

Dresser Manufacturing Division, 319 Fisher Ave., Bradford, Pa. (One of the Dresser Industries.)

GET THESE FOLDERS NOW!

Interesting engineering data on varied types of lines installed with Dresser Couplings. This is file material.

DRESSER MANUFACTURING DIVISION
319 Fisher Ave., Bradford, Pa.

Gentlemen: Please send me your "Report of Dresser Coupled Lines," your "Bridge River" reprint, and "Style 38" catalog.

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Firm_____
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VERSATILITY IS NEEDED if engineers are to keep up with the times, Vannevar Bush tells joint engineering societies meeting in New York.

Engineers in the future . . .

. . . As Vannevar Bush sees them

VANNEVAR BUSH, president of the Carnegie Institution of Washington, had some thought-provoking comment to make about engineers in the years ahead as part of his talk on "Trends in Engineering" at a joint meeting of the New York sections of the Founder Societies on April 16 (ENR May 1, p. 64).

As a preliminary to his discussion of the place of the engineering profession in the country's expanding and diversified economy, Dr. Bush discussed the relationship between engineers and applied scientists and outlined his thinking as to the type of training engineers will need to fulfill the demands to be put on them in the years ahead. His comment on those points follows:

What, then, is an engineer? A definition that is convenient for our purposes is that he is a man who applies science in an effective manner to supply human needs and desires. But what then is an applied-scientist? He apparently does almost the same thing. The difference lies in the definition of the word "effective."

The applied-scientist is ordinarily satisfied if he can develop a new device, a new process or a new material which will work in a practical manner, often for his own use or for the use of other scientists, but often also as one link in the long chain from a new scientific concept to its practical utilization.

On the other hand, when we speak of effective application in connection with the engineer, we have in mind that science will be applied effectively within the economic nexus.

Such application involves the interaction of scientific effort with all phases of business, development, production, sales, and finance. To some extent, therefore, the engineer takes over where the applied-scientist leaves off. Seldom indeed is it that an engineer carries a matter clear through from the fundamental scientist's concept to its full practical application. The applied-scientist reaches farther back toward new knowledge, and the engineer farther forward toward human use. The two groups are complementary rather than competitive, and the dividing line between them is by no means a sharp one.

• **Applications of science become complex**—Today the nature of the science that is being applied, and the nature also of the needs and desires of the users, are both altering radically. Not only are new phases of science being applied, but the application is becoming more diversified. It is also becoming complex and often involves in a single application several of the old fields of science. There is a danger here.

The danger is that the engineer will become set in a groove and that much of his function will be taken over by the applied-scientist.

Specifically, there may be a tendency to turn to the engineer only for those things that are so matured that they have begun to appear in handbooks, and to turn to the applied-scientist for the novel approach—for the new and pioneering activity that is especially attractive from an intellectual standpoint. Much of the training of engineers leads to a compartmentalization that contributes directly to this tendency.

Who would think of tossing to a young electrical engineer a tough problem in the chemical engineering field? Yet this is just the sort of thing that we must expect as our industrial effort becomes more ramified and as the problems we attack become more interwoven with the the whole fabric of diversified science that is now being utilized, unless we are willing to abdicate to the applied-scientist the most congenial part of the engineer's function.

I fear that only too often the young man with a scientific background is more flexible under novel circumstances than is the young engineer, and this is much to be regretted.

It is to be regretted because we cannot give up the most cherished attributes of our profession—versatility and resourcefulness—without making our jobs unattractively one-sided and conventionally drab.

• **Scientists become engineers**—We now know that applied-scientists can readily become engineers. During the war, for example, at the Radiation Laboratory in Cambridge, a group of physicists started in on radar development—which was a laboratory affair at the time. But they soon entered perforce into engineering applications of the most ramified type, and became engineers in the process.

When a new field of science appears it is often easier for a young scientist to grasp the essence of the engineering practice associated with it than it is for an engineer to learn the new science.

• **Engineers lack flexibility**—But if there is, as I suspect, a lack of flexibility among our young engineers by reason of their training, not only in the engineering school but in industry, this is a matter to be overcome for the good of the profession. It should be overcome also because the public is in need of the sound judgment of the engineer, with his knowledge of the interrelation of manufacture and economic use, in the present trend toward a wider and more intensive application of science.

We need to introduce as a keynote of engineering education versatility,

flexibility, and the willingness to pioneer.

We ask a great deal of an engineer. We require that he understand science, or at least that he have such a fundamental grasp of it that he can readily acquire a working knowledge of those aspects of any field of science which are ready for application. On the other hand we require that he be proficient in economics, in business, and moreover that he have a working knowledge of those branches of social science having to do with human reactions in organizations or in the market places.

The second requirement is more severe than the first. Often it is met, not as a result of formal studies in the field, but as a consequence of practice, of living in a world of men, and of being alert and able to continue to learn.

It would be a calamity, not only for the engineering profession but also for the public at large, if the engineer should abdicate his true position by failing to meet expanding demands and opportunities. Wider applications of science must be made with a keen realization of their ultimate effect upon society.

• **What must be done**—There is no doubt that the scene about us is changing rapidly. Certainly the engineer must understand science on the one hand and people on the other. And he must know how to bring into one equation his knowledge of both in order that the cost of their functioning when they are brought into harmonious relation with each other may be less than the value of the social gain that results.

But no man can understand all of the sciences. Even scientists themselves cannot today read everything that is published currently in their own special fields. It is too much to ask, therefore, and it would be utterly unreasonable to ask, that an engineer understand science in all of its ramifications.

The point is that the engineer should be able in a few evenings to delve into any indicated corner of science that is nearing application, to understand what he finds there, to grasp the essence, to judge relative importance, and to avoid being misled.

He will be able to do this only if versatility is part of his very nature, and such ingrained versatility must be acquired early during the period of his education. He also needs to be able to understand modern society and to work in it effectively. To do this is fully as difficult as to comprehend the scientific field, which he touches with the other hand. The fields of knowledge which lie in the humanities and the social sciences are just as important to the engineer as the ones that lie in the physical and natural sciences.

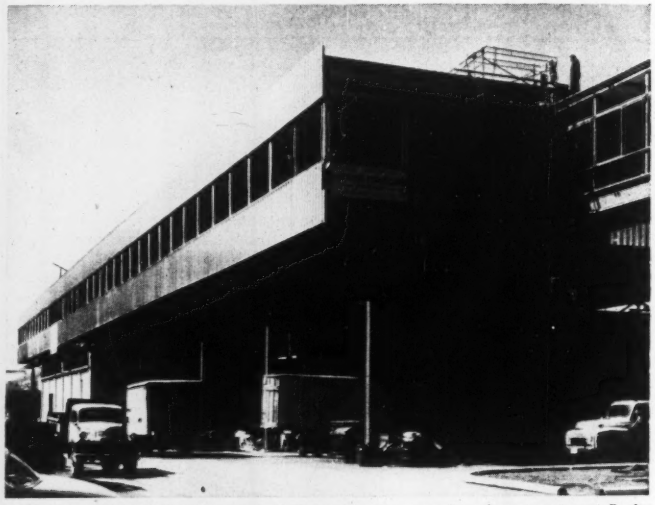
Here again the engineer can hardly be expected to understand all of economics, all of the social sciences, all of business methods. But if he has the right sort of mind he can dip into these fields also as he may have need, and understand what he explores.

• **Will there be enough engineers?**—It is said that there may be a great lack of engineers in the years ahead. I do not think this is necessarily true if the scope of our profession is enlarged in the manner I have suggested. Many of our greatest engineers in the past have come into the profession by unusual paths. There is no reason why we should not make engineers out of men from other fields if we need them, especially if they find among us a satisfying opportunity.

I think we can increase our number if we open up the unusual paths and if we regard the functioning of an engineer in a broader way than it is sometimes delineated.

• **More breadth in education**—Unfortunately, in our engineering education, and in industry for that matter, we have often in the past lost sight of the importance of breadth and adaptability in our engineers. In attempting to become general we have often in the past merely become superficial. We need to learn how we can develop among our young neophytes and in our profession generally those attributes which enable men to adapt themselves to change soundly, neither rushing blindly and without understanding into the novel path nor remaining in a groove which leads nowhere except into oblivion.

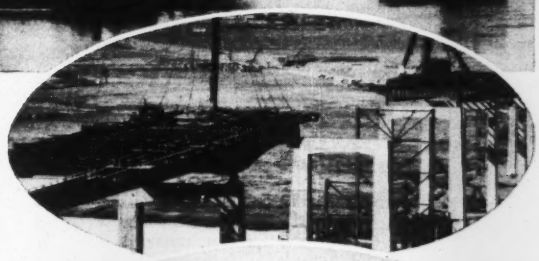
The engineering profession is an attractive profession, for its reach is broad and its contribution to human welfare is great. Its rewards are generous, in respected position in society and in satisfaction. It has new challenging opportunities before it. To meet these it must be courageous and versatile.



UPWARD PROGRESS—To get needed space for its research and engineering staff, the A. O. Smith Corp. took to the air at its main plant in Milwaukee. Thirty-two feet above ground space already occupied by other plant functions, the company is building a 380x90 ft one-story addition. The $500,000 addition (above) is connected to the rear of the firm's main research building (corner shown at right) by an enclosed passageway at the third floor level. The new unit is built on 14 in. steel H-columns resting on concrete piers. Outer walls are insulated cellular siding faced with aluminum and plastered on the inside. Insulation is glass fiber. Continuous fixed windows with double glazing will be used around the entire structure. The gypsum plank roof is topped with pitch and gravel and ceiling will be glass-fiber tile. The floor is also gypsum plank, topped with two sheets of ¾-in. plywood and finished with asphalt tile. Underside of the floor will be covered with insulating plaster. The 3½-ft deep space between ceiling and roof will be used as a return-air plenum and for airconditioning ducts. Grassold and Jackson, Milwaukee, are architects for the project and the Peters Construction Co., Milwaukee, is the contractor.

375-ft. Plate Girder Span

ANOTHER RECORD-HOLDER* BUILT BY AMERICAN BRIDGE!



Project: Hackensack River Bridge
Owner: New Jersey Turnpike Authority
Consulting Engineers: Howard, Needles, Tammen & Bergendoff
Consulting Architects: Fellheimer and Wagner
Fabricated and Erected by American Bridge Division, United States Steel Company

**Fabricated and erected by American Bridge, the new Hackensack River Bridge on the recently opened N. J. Turnpike is co-holder of the record for the country's longest plate girder main spans.*

THE completion of the Hackensack River Bridge near Laurel Hill, New Jersey, by American Bridge, and the Passaic River Bridge by another contractor, permitted the opening of the final nine-mile section of the 118-mile New Jersey Turnpike. These two bridges with main spans of 375 ft. set a new U.S. record for lengths of plate girders.

The Hackensack River Bridge has a total length of 5613'3" c. to c. of end bearings on abutments and provides six 12 ft. traffic lanes, a 6 ft. center mall and two 3 ft. safety walks. The 375 ft. main span with two flanking spans of 275 ft. each, c. to c. of bearings, are composed of two continuous girders spaced 56' apart with a maximum depth of 21'6½" b. to b. of flange angles over the piers.

The south approach contains a 5000 ft. radius curve and the north approach a 4000 ft. radius curve. The spans on curves are super-elevated and both approaches are on a 3% grade with a 940 ft. length vertical curve symmetrical about the center of the river span. Silicon steel was used for all main girder material.

The New Jersey Turnpike now provides another link in the envisioned north-south expressway and extends from the Delaware Memorial Bridge below Wilmington, Delaware, to connections with the main crossings of the Hudson River to New York—the Holland and Lincoln Tunnels and the George Washington Bridge.

The over fifty years of bridge building experience, the technically trained personnel, the most modern equipment of American Bridge, were needed to build a bridge of this magnitude, again living up to its old motto, "If the engineers can design it, American Bridge can build it."

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AMERICAN BRIDGE

UNITED STATES STEEL

FILTERED WATER TUNNELS for Chicago's new 960-mgd, $85-million Central District Filtration plant will be similar to this 16-ft Chicago-Section tunnel.

FILTRATION DESIGNER Salter (at left) and City Engineer DeBerard study subterranean rock profiles to determine proper depth of tunnels below lake level.

Chicago to build big water tunnels

Chicago will take bids July 15 on 6 miles of large tunnels. It will be step No. 2, constructionwise, in the city's new 960-mgd, $85 million central district filtration plant. All but 330 ft of the tunnels will be in rock (Niagaran limestone), and with a maximum depth of invert 220 ft below the level of Lake Michigan.

The tunnel system including concrete lining and 7 permanent work shafts is expected to cost from $13- to $16-million.

• **Three contract sections**—For the purpose of taking bids, the system is divided into three sections: section A includes 4 work shafts, 1,480 ft of 20-ft tunnel and 11,390 ft of 16-ft tunnel. Section B includes one work shaft and 14,000 ft of 16-ft tunnel. Section C includes two work shafts: 4,700 ft of 16-ft tunnel; 200 ft of 12-ft and 240 ft of 8-ft tunnel. All tunnels will be Chicago section (vertical sides and semi-circular roof). They will be lined with a minimum of 8-in. of unreinforced concrete. One work shaft will be 20 ft dia; the other six 16 ft.

• **To serve 2,320,000 persons**—The 20-ft tunnel will be a raw water intake tunnel, served by existing tunnels from the Harrison and Dever cribs, offshore in Lake Michigan. The 16-ft tunnels will furnish treated and filtered water to two existing pumping systems. One system, with five pumping stations serves the Central District. The other, with three pumping stations, serves the North side of Chicago. Total population of the two districts is 2,320,000.

• **Sonic rock-soundings**—Over 18,000 ft of the main section of tunnel will be underneath the lake. And a 50-ft minimum of rock coverage was deemed necessary to avoid contamination of the filtered water.

This called for accurate profiles of the top of bedrock, which were made last year with an electronic depth-finder manufactured for the Navy. The sonic soundings to rock were made as a joint undertaking of the U. S. Geological Survey and the city (ENR Aug 23, 1951, p44).

Work shafts are located for dry land construction. Four are on shore. The other three are in the 61"-acre site of the filtration plant, just North of Navy pier, but the starting date for this part of the work (section A) has been set for Nov. 1, 1953. At that time the site should be enclosed with a coffer dam and dewatered.

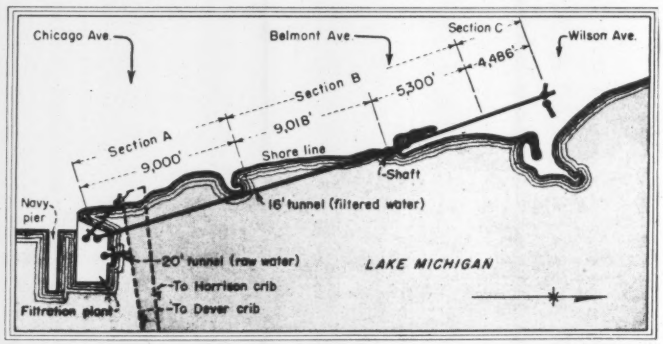
• **Cofferdam contract awarded**—The Great Lakes Dredge & Dock Co., Chicago, were awarded a $6,600,000 contract on May 28 of this year for constructing this cofferdam. It includes 4,500 ft of earth fill, clay-core dike-type cofferdam, covered with stone; and 2,040 ft of sheetpile cellular cofferdam.

Starting date for both section B and C are Sept. 1 of this year. Completion dates are: section C, April 1954; section B, September 1955; and section A, November 1956.

• **Complete plant by 1958**—The entire filtration plant is expected to be completed and in operation by June 1958. This is a 6-year construction program, starting with June of this year.

Construction funds (see table) will be secured from two sources of revenues: (1) water-service revenues resulting from the 50% increase in rates that went into effect last year; and (2) the sale of water revenue bonds.

(Continued on page 54)



RAW WATER TUNNEL will be served by present tunnels from two existing cribs in Lake Michigan, while other tunnels will deliver treated and filtered water to pumping systems serving 2,320,000 residents in the city's central and northside districts.

Carnegie Endowment's 12-Story "INTERNATIONAL CENTER"

Opposite the United Nations Plaza

SAVES STEEL WITH REINFORCED CONCRETE

OWNER: Carnegie Endowment for International Peace. ARCHITECTS: Harrison & Abramovitz. GENERAL CONTRACTOR: Cauldwell-Wingate Co.

In this impressive Manhattan structure, planned for the use of nonprofit organizations active in promoting international understanding, reinforced concrete was chosen for framing and floors . . . in order to *save steel* for national defense.

By designing their structures for reinforced concrete, builders all over the country are conserving the nation's vital steel supply and stretching their own steel allotments. Furthermore, they are *reducing the cost* of the buildings they erect.

Because reinforced concrete framing is faster to erect, it also provides extra months of rental income. In addition, it is inherently firesafe and durable—highly resistant to wind, shock, and quakes. On your next structure, *design for reinforced concrete!*

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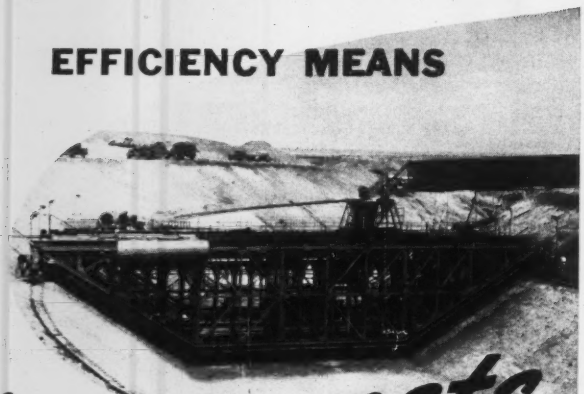
EFFICIENCY MEANS



lower costs

QUESTION:

What is the cost of trimming subgrade? IT CAN BE FREE.

THE RECORD SHOWS:

On the Delta Mendota Canal in the San Joaquin Valley, California, (48' bottom width, perephia: app. 114') Guntert & Zimmerman's subgrader trimmed this canal at an average rate of 1000', average excavation depth 1 ft., or 4222 cubic yards per 8 hours, or 525 cubic yards per hour.

The payment received for the rough excavation accomplished by this machine more than paid for the fine grading.

In the next issue, Guntert and Zimmerman will show what they have done and can do for you in cutting canal construction costs.

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The bonds, will be retired with water-service revenue funds, over a 24-year period.

• **Engineers in charge**—The 6 miles of water tunnels, and appurtenances, were designed under the supervision of W. W. DeBerard, city engineer, reporting to Oscar E. Hewitt, Commissioner of Public Works. F. G. Gordon is assistant city engineer; J. R. Baylis, engineer of water purification; and George S. Salter, engineer of filtration design.

Yearly construction expenditures

Year (Beginning in June)	Income (Thousands of dollars)		Expenditures (Thousands of Dollars)
	Water Receipts	Revenue Bonds	
1952-53	$4,000	$3,000	$7,000
1953-54	4,000	4,000	8,000
1954-55	4,000	12,000	16,000
1955-56	3,500	16,500	20,000
1956-57	3,000	14,000	17,000
1957-58	3,000	14,000	17,000
		Total	$85,000

Quarterly spending is $27 million on sewage

Municipalities in 33 states have awarded contracts for the construction of 111 sewage treatment plant projects during the first quarter of 1952, the Public Health Service of the Federal Security Agency reported today. The projects involve a cost of $27 million.

Of the 111 projects reported, 72 are new plants being built at a total cost of about $17 million. The remaining 39 consist of additions to, or replacements of, existing plants.

No figures are available on progress in the abatement of industrial wastes, the other major source of water pollution. A national summary report published by PHS in 1950 showed that of the 10,400 industries known to be discharging wastes, nearly 3,500 needed new or additional waste treatment facilities while over 5,500 more had undetermined needs.

Typical of the activities of some states in fighting pollution is the action of Wisconsin in pressing a drive against pollution as . . .

Wisconsin orders 85 to clean up waters

Eighty-five water pollution abatement orders with time limitations for compliance among listed offenders in the Rock and Sheboygan River Basins

were issued last month by the Wisconsin State Committee on Water Pollution.

There is heavy pollution on both rivers, damaging much of their public recreation value, it was noted. The Rock River drains through a rich farm area, with nearly every municipality having one or more milk receiving stations. There also are many canning plants and metals and textile industries. The Sheboygan River, emptying into Lake Michigan, flows through an equally fertile farm section, one of the biggest cheese producing areas in the state.

The state's program is to have the industries now overloading treatment plants co-operate in expanding plants or pretreat and handle their own wastes.

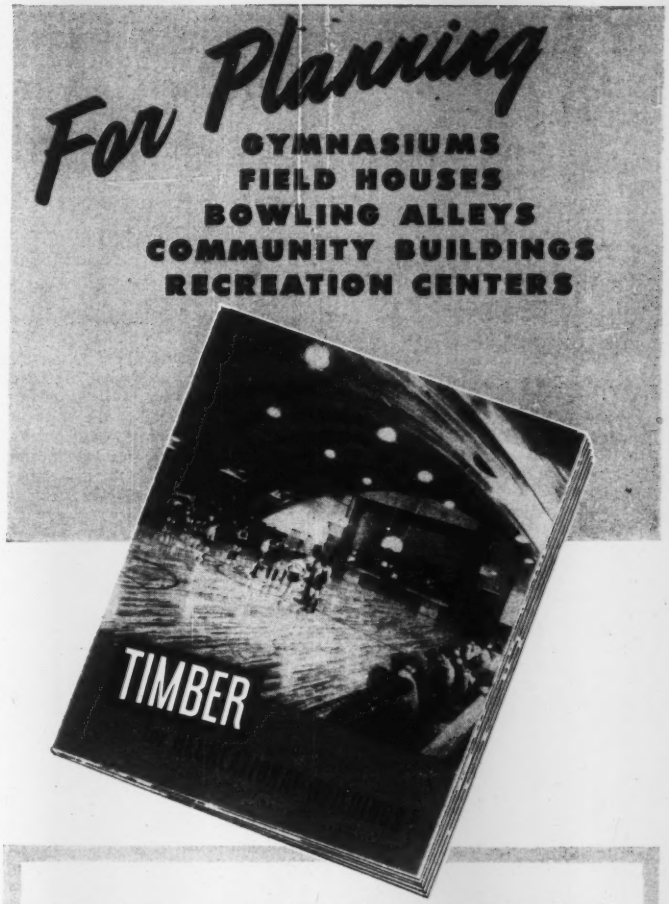
• **Orders**—In its new orders, the state urged that cities improve their sewer systems and build storm sewers for "clear water." The committee frowned on combination sewers, finding "entirely too much bypassing of sewage and wastes" during storms, causing periodic and avoidable pollution."

• Of more than 50 orders issued in the Sheboygan River Basin, the most stringent was to Port Washington, one of two cities putting untreated wastes into Lake Michigan. This rapidly expanding port city has employed an engineer, made surveys for more sewers and prepared drawings for a modern treatment plant. The state ordered the city to build a better sewer system and have its new treatment plant in operation by July 1, 1954. Beloit and Cambridge were also ordered to build needed treatment plants.

• Sheboygan was ordered to build a secondary treatment plant. The city was told to have the needed facilities by Dec. 31, 1955.

• The committee found that the treatment plant at Elkhart Lake, built in 1906, was structurally defective. The village, which has retained a consulting engineer, was told to prepare plans by July 1, 1953, and construct needed facilities by the end of 1954.

• Fort Atkinson was ordered to make an over-all survey for improved treatment of both sanitary and industrial wastes and do something to separate the clean water flow of storm sewers away from the treatment plants. It was told to have plans ready by July 1, 1953, and have facilities constructed by Dec. 31, 1954.



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Ohio writes a building code

- **How it got to be written**
- **A preview of the code**

One of the worst problems with which engineers, architects and contractors have to contend is that of the obsolete building code. The freezing effect of ancient codes on progressive construction is too well known to need laboring now.

But at times the problem of writing a new building code seems insurmountable. Here is what the state of Ohio is doing about the problem:

The building code of the state of Ohio was written into Ohio's laws in 1911. It failed to give recognition to new building materials, new types of construction and new techniques that have since been developed.

The code is scattered through the general code of Ohio. It contains many ambiguities, and is almost impossible to enforce literally. The pressure to do something about it has been building up for a number of years.

1 Writing the new code

The Ohio Program Commission was created by an act passed in July 1949. One of the problems which this commission was asked to study was the Ohio building code.

• **First step**—A building code committee consisting of 31 members was appointed to make the study. The committee members represented the administrative and legislative branches of state government, city government, building and loan groups, building contractors, building trades, architects, engineers and the general public.

This committee held its first meeting in early May 1950 and answered these basic questions:

• **Should the present code be patched up or must a completely new code be written?**

Almost unanimously it was decided that patching up would only add to the confusion and a completely new code was needed.

• **Should the new code be a "performance" or a "specification" type code?**

The older building codes were "specification" codes which tended to retard the adoption of new techniques and materials. The decision was to make the new code a "performance" type code.

S. O. LINZELL, director, Ohio department of public works, and chairman, building code committee Ohio program commission.

• **Should the committee bear the responsibility of encouraging critical public review thereby relieving the legislature of some of the burden?**

The committee's decision was to have the code thoroughly reviewed by those groups that would be affected so that when presented to the legislature all possible criticisms could be met.

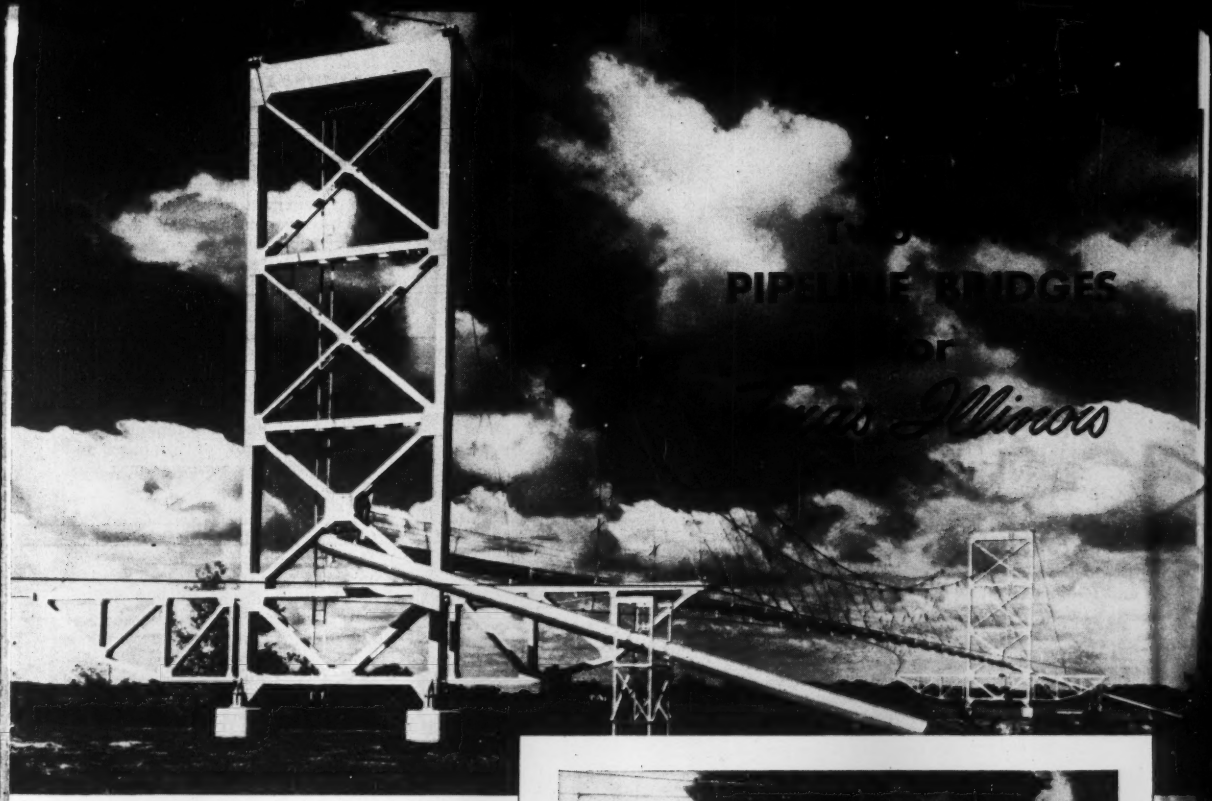
With these guide posts established, the next problem was how to get the job done.

The complete change in philosophy which said: "dont patch up the old code", and "let's have a performance code, not a specification code", and let everybody "have a look at it and criticize it before it goes to the legislature", presented a problem that spelled plenty of work, much criticism and no quick scissors and paste work that would get the job done in a hurry.

Others had tried to formulate a complete building code by establishing committees and subcommittees composed of members working on a voluntary basis and all such previous attempts resulted in such a hodgepodge of unrelated ideas that no acceptable document could be written.

• **Staff work**—It was decided that a full-time technical staff prepare and write a code conforming to the policies established by the building code committee. This technical staff would prepare preliminary drafts of the code,

(Continued on page 58)



Colorado River Bridge, near Glenflora, Tex., carrying Texas Illinois 26" O.D. gas pipeline. Main span of 550' has provision for a second line.

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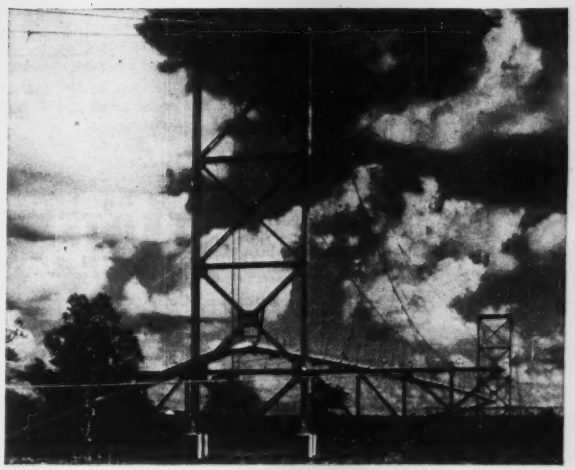

Brazos River Bridge, near Simonton, Tex. 750' main span carries Texas Illinois 30" gas pipeline, and is designed for future additional line.

These bridges were designed by Matthews & Kenan, consulting engineers of San Antonio, Tex.

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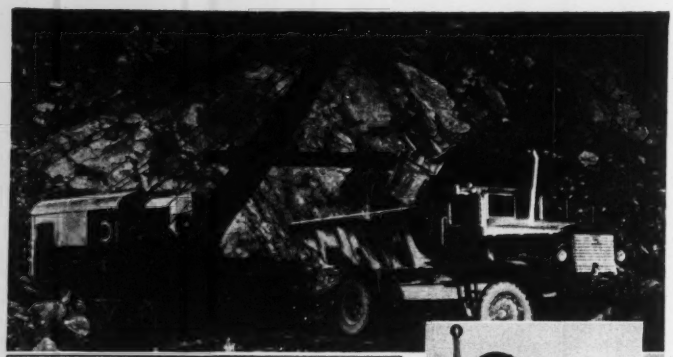

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be present at all hearings, meet criticisms and prepare the code in a form as nearly acceptable as possible, for presentation to the legislature.

Three committees have been appointed to review the work and assist the technical staff.

• The code drafting subcommittee, consisting of three architects, a building official, an attorney and one of the members of the legislature—makes the first review and settles matters of policy.

• The bill drafting subcommittee consisting principally of attorneys and is responsible for review from a legal standpoint.

• The technical advisory committee furnishes much helpful criticism. The following societies are represented on this committee: American Society of Heating and Ventilating Engineers; American Society of Mechanical Engineers; Architects Society of Ohio; Ohio Association of School Administrators; American Institute of Electrical Engineers; Ohio Society of Professional Engineers; American Society of Civil Engineers; Illuminating Engineering Society and American Society of Sanitary Engineers.

• **Actual work**—The first step in actual code preparation consisted in preparing a general outline of the code followed by detailed chapter outlines. Thereafter each chapter as it is prepared in preliminary form is reviewed by the three committees who present criticisms and assist in producing satisfactory modifications. After this review, each chapter is sent to all interested groups for comment and criticism. These groups are those representing the various building material manufacturers, the building trades, contractors and public officials.

After this wide-spread circulation, public hearings are to be held. The committees and technical staff will then work out final changes before presentation to the building code committee and Ohio Program Commission.

II Preview of the code

The code will closely resemble the Basic Building Code of the BOCA. There will be more emphasis on performance requirments. Enforcement will still be in the hands of the local building officials State officials will act as enforcement agents in areas where there is no established building code enforcement agency. Many of the chapters and sections will have

repetitions of phrasing which will add to the voluminousness of the code, but this is being done to cut down the amount of cross referencing and make it easier for the layman to understand.

• **Occupancy and construction**—The requirements for each occupancy use group are to be listed under occupancy chapters and the requirements for each type of construction are designated in a chapter on types of construction. In some codes these requirements are combined, resulting in confusion.

General requirements such as stairs, light, ventilation, loads, stresses and systems of construction, are given.

• **Acoustics**—It is proposed that the requirements for acoustical treatment and interior finished will be handled by grading the materials into five classes determined by flame spread tests. Materials of flammable composition will be limited in fireproof and noncombustible types of construction.

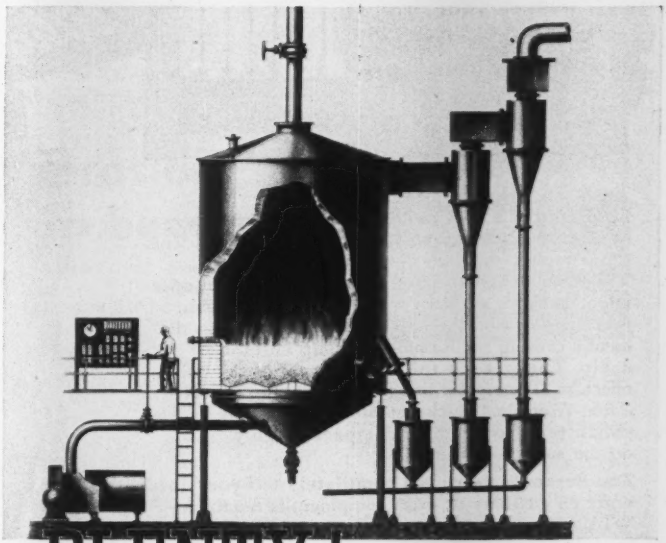
• **Fire resistance**—Generally more fire resistive material will be required in vertical exitways than in horizontal exitways. More fire resistive material will be required in higher buildings. In public buildings higher fire resistive material will be required. More fire resistive material will be required where open walls are used. Relaxation of fire resistance of finish material will be permitted where the surface area of the material is divided into smaller areas and where sprinkler protection is provided.

Where fire resistance is required, interior finish must be installed on light furring.

• **Performance standards**—One of the most sensitive problems which faced the committee was the method by which performance requirements were to be established. The legislature of the state of Ohio is jealous of its prerogatives and will not waive its legislative powers. This situation makes it impossible to adopt national standards by reference unless tied down to a specific standard of certain specific data. Since the national standards and specifications of such agencies as ASTM, ASA, NBFU, and others cannot be named under the law, they will be established as acceptable standards. The state building official will be charged with the responsibility of reviewing national and industry standards.

All decisions of the state building official regarding these standards will be subject to appeal to a Board.

WHAT'S COOKING with the Sulphur Shortage?



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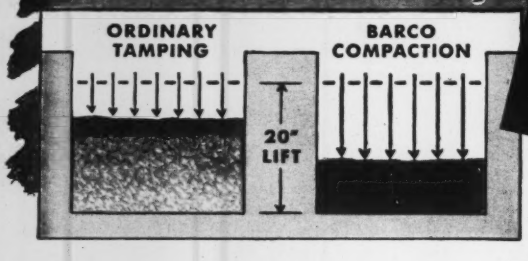

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SAND PUMPING lines shown here are slowly building up the eroded beach (Evening Bulletin).

Ocean City fights erosion as it pumps sand to beach

Ocean City, one of southern New Jersey's major Atlantic Coast resorts, has under way one of the biggest beach reclamation projects ever attempted.

Mountains of sand are being pumped across the island resort to save a 2-mi long stretch of beach, the Boardwalk and Boardwalk properties from destruction by erosion.

When the job is finished on June 27, some 1.5 million cu yd of sand will have been piped one half mile across the resort to reinforce, and in many cases restore, beaches washed away almost completely in the last few years.

Ocean City, which each summer welcomes more than a million visitors, is hopeful that its once fine beaches in the affected section will again be available to bathers.

In Great Egg Harbor Bay, two big dredges are sucking up the sand 24 hours a day. The sand is then piped across the resort. Already one-half million cu yd have been moved from bay to ocean-front, and twice that much is still to come.

The project is the city's knockout punch aimed at the Atlantic Ocean, which has been slashing and gouging Ocean City beaches and washing away properties worth many thousands of dollars.

The $418,500 operation is jointly financed by the city and the State of New Jersey.

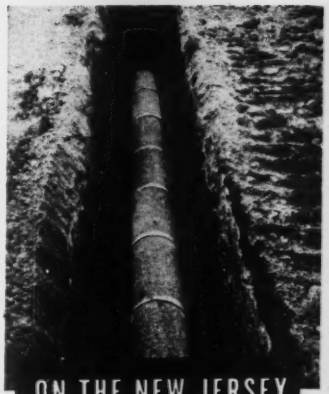
But it is the last job in the world that Ocean City expected to face when its new Boardwalk was laid in 1928. A year before, on October 11, 1927, the city's old Boardwalk was wrecked by a $1.5-million fire. Because the beach had been building up steadily since 1919, the city decided to put up its new Boardwalk several hundred feet closer to the ocean.

It looked like a good financial proposition for the municipality at the time. The boom was under way. The lots for the reclaimed land brought, then top boom-time prices, to line the city treasury. In addition, the business buildings, commercial structures and private dwellings that went up added a lucrative tax-revenue income.

Everyone now admits it was a regrettable decision. As if by signal, the beach began to erode. It has been eroding ever since. Aided by a couple of hurricanes and near-hurricanes, it eroded up to the three-mile Boardwalk and under much of it. It forced several summer homes off the shore and washed far beyond Music Pier, the resort's pride and joy, which was built with the Boardwalk.

• **Solutions**—The city decided to do something about it. The resort first tried a series of stone jetties built out from the beach to channel the tide. The results produced no cheering. Little or no beach was added through their construction.

The city commission voted for more drastic action. Mayor Edward Bowker dusted off a plan which he and others had formed in 1939 but had dropped during the war. The city commission checked with Atlantic City which six years ago pumped



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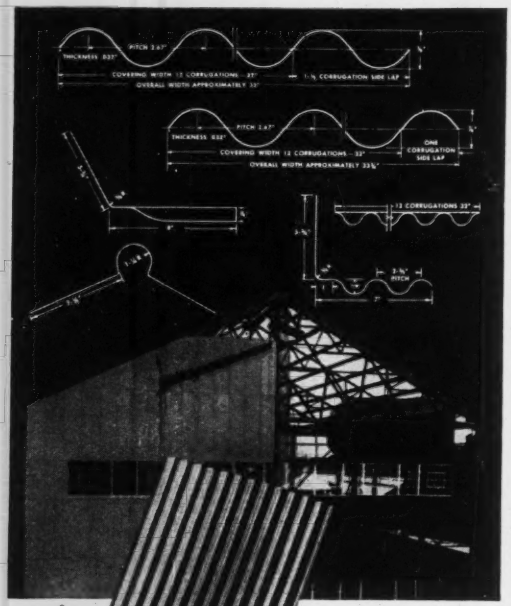

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new sand into a portion of its beach—with moderate success. They also consulted Robert Moses, New York planner, who designed Jones Beach.

Despite some opposition from residents living inland, the commission last December voted to go ahead with the sand pumping operation, and won support from the state.

• **Sand pumping**—The Hill Dredging Corporation of Atlantic City got the contract, with the city paying $300,000 and the state $118,500. Ocean City was lucky to have an inexhaustible supply of sand just a stone's throw away in Great Egg Harbor Bay.

A narrow channel through the bay forms part of the New York-to-Florida Inland Waterway, but most of it is composed of shoals and sandbars and very shallow water. Hill Dredging started dredging about 1,000 yards from shore. First, however, the entire dredging area was covered by New Jersey state engineers who took about 10,000 soundings to determine the depth of the water.

Each sounding was recorded on a ground map so that a second sounding, taken after a dredging, would show how many cubic yards of sand had been moved. At about the same time, two corrugated iron pipes—the tired beach's lifeline—were laid straight across the city along Fifth Street. The pipes were laid under several intersecting streets and above two others, blocking them.

They were run into the bay on pontoon tanks which were sunk under the narrow channel to a depth of 20 ft. The larger pipe, a 22-incher, ran to the dredge Ventnor. The other, a 16-inch pipe, went to the Pioneer.

The Pioneer's hydraulic suction pump started feeding sand and water through the pipe on April 7. It took eight minutes for the sand to reach the beach. It has since been pouring out in a steady stream. The area between, reclaimed—it is hoped permanently—extends along a two-mile stretch in the most populous section of the city and in the center of the eight-mile beach that the resort boasts.

The two dredges pump to areas assigned. Small crews work three shifts on the dredges and beach, running the pumps and checking pipes for leakage. Stakes, marked by engineers and placed in the sand, show the pipe crews which sections of beach need bolstering and how much.

When it's time to move the pipe to a new section, the crews aided verbally by Boardwalk kibitzers during the daylight hours—add or pull off

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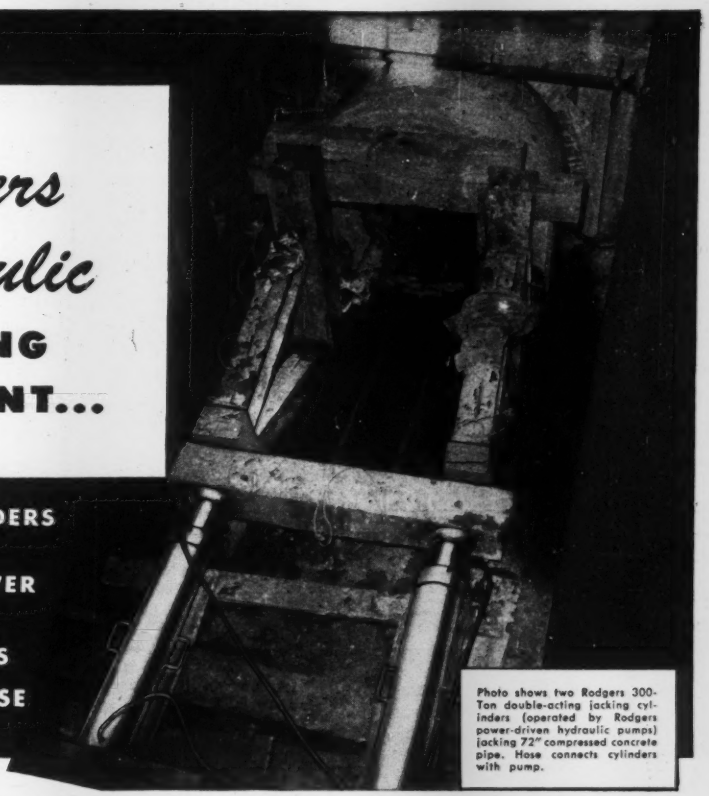

Photo shows two Rodgers 300-Ton double-acting jacking cylinders (operated by Rodgers power-driven hydraulic pumps) jacking 72" compressed concrete pipe. Hose connects cylinders with pump.

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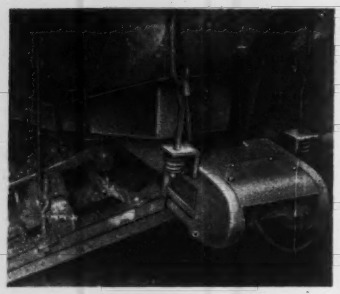

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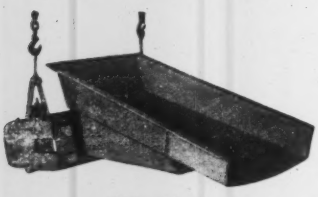

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SYNTRON COMPANY
328 Lexington Homer City, Pa.

15-ft, 400-lb sections like they were stovepipe.

Engineers figure the pipes disgorge about 36,000 cu yd of sand daily—enough to build a mountain a yard square and 20 miles high. And enough to give the Atlantic Ocean pause.

At this rate, the beach will extend 200-ft beyond the Boardwalk on the scheduled completion date of June 27—just in time for the summer season.

The beach reclamation has spurred summer rentals and boosted sales prices of property in the affected area. City officials say the new sand gives Ocean City the best beach on the Jersey shore. Engineers agree that it's a finely grained, pure white sand, hard to find.

Owners of property and visitors who reside in nonaffected sections of Ocean City are also happy about the project. Visitors from the affected areas swarmed down to the unaffected beaches and overcrowded these. This summer, traffic on these beaches will be eased.

Yachtsmen and fishermen are happy about the dredging because, they say, it benefits their avocations. In clearing out a portion of the bay, the dredges are opening a larger area to sailing, one of Ocean City's most popular sports. Fishermen say bay fishing will be improved and for the first time in years they will be able to cast from center city beaches.

Ocean City prides itself on its distinction—self applied but generally agreed upon—as "America's greatest family resort."

Once a camp meeting ground of the Methodist Church, the city has no liquor stores, no Sunday movies and no games of chance, and its 6,000 regular residents are proud of it.

The beach reclamation is removing the resort's major concern and problem for several years.

Farther south another shore municipality was considering a plan to restore its beach which was also badly eroded by the sea . . .

Virginia Beach shoreline improvement recommended

Extensive improvements to restore and protect the ocean beach and shoreline of Virginia Beach, Va., with the federal government paying one-third of the cost, have been recommended by field officers of the Army Corps of Engineers.

The recommended plan will go to the Beach Erosion Board in Washington, D. C., for review. It proposes to restore the beach to a width of 100 ft at an elevation of 7 ft above mean low water, throughout the town limits, by artificial placement of sand, at a total estimated cost of $1,160,000. It also recommends the construction, at a later date, of 21 creosoted timber groins, at an estimated cost of $864,500, to help protect the restored beach, if it is found to be economically justified.

The recommended federal contribution is estimated at $377,000 for restoration of the beach, and an additional amount of $298,000 for groins should their construction be undertaken.

The recommendations are subject to the municipality of Virginia Beach submitting detailed plans and specifications for the work, and arrangements for its prosecution to Lieutenant General Lewis A. Pick, Army Chief of Engineers, for approval prior to commencement of work.

Other conditions require that the municipality give assurance of continued public ownership of the shore and its administration for public use only; that pollution that would endanger the health of bathers will not be permitted, and that it will accept responsibility for maintenance and repair of the works throughout their useful life.

The reporting officers found that erosion has seriously damaged the municipally-owned sea wall; that public and private property shoreward of the sea wall and adjoining protective structures are seriously threatened; that more than 6,000 ft of the bathing beach has been severely eroded, and that the remainder of the beach has been reduced to a critical width.

• **Never ending job**—The engineers are of the opinion that after the job is completed, the ocean will still erode two feet of beach annually. They propose therefore that every three years additional sand be pumped back on the beach.

Pittsburgh asks right to fluoridate its water

The city of Pittsburgh has applied to the Pennsylvania State Health Department for permission to fluoridate its water supply to prevent tooth decay.

The Pittsburgh City Council approved fluoridation late in 1950 and an application to install two gravimetric feeders at the filtration plant in suburban Aspinwall then was submitted to the state officials. Pittsburgh's 100 mgd will get 1 ppm fluoride.

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...or a small one?

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The Mixall is the ideal patching or maintenance mixer—a natural result of Barber-Greene's years of research and engineering experience as the leader in the bituminous paving field. It offers an exclusive combination of an efficient rotary drum aggregate dryer with a proved B-G twin shaft heated pugmill mixer, and is called the Mixall because of *all* the things it can do . . .

MIX ALL QUANTITIES: from a single batch up to 5 tons per hour of hot mix—or up to 10 tons per hour of cold patch. Ample for all maintenance and small paving jobs.

MIX IN ALL LOCATIONS: towed to the job by truck loaded with aggregate . . . fed directly from truck or from stock pile or pit. Can work in a single traffic lane.

MIX IN ALL WEATHER: heated aggregate makes low atmospheric temperature mixing possible—allows quick repair to prevent major failures.

MIX ALL TYPES: of bituminous patch material including stabilized mixes—as well as Portland cement mixes of lower slump than can be produced by conventional concrete mixers.

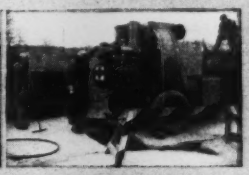
see your B-G distributor or send for details

material you want ..where and when you like it

the NEED

During the war our roads took a terrific beating—while new construction and repair programs were cut to a minimum. Since the war, in the face of ever heavier traffic loads, rising costs and lack of funds continue to limit new construction and place an even greater burden on maintenance programs in city, town, county and state. Road maintenance is primarily patching—the "stitch in time" that prevents major breakups. Yet until the advent of the new Mixall, an efficient and economical means of producing all types of hot, high-quality patch material has not been available.

***ROTARY DRUM DRYING AND HEATED TWIN SHAFT PUGMILL MIXING** under independent control mean that the Mixall produces the finest hot patch material, regardless of the type needed.*



***NO SETUP TIME REQUIRED:** the Mixall doesn't have to be unhitched from the truck unless the truck is needed elsewhere. Even unskilled labor can quickly become expert at Mixall operation.*

is ANSWERED

MUNICIPALITIES: the Mixall makes possible immediate attention to patching and other maintenance needs regardless of quantity of mix, type of mix or location of job. The Mixall takes mixing out of the pit and right to the job, wherever you want it.

CONTRACTORS: a virtually untapped market promises profit to those who go after it with the Mixall—driveways, sidewalks, barn floors, railroad crossings, outdoor storage areas, service stations, parking areas, tennis courts, playgrounds, etc.

SEE IT IN OPERATION: Complete demonstration programs are being carried out by Barber-Greene Distributors who are also presenting the sound-color movie, "Here Is The Answer." Get in touch with your B-G Distributor and arrange to be present. In the meantime, fill in the coupon and send for more complete details.

A small, highly portable unit, capable of on-the-spot production of even the highest types of hot mixes comparable to those produced in Barber-Greene's largest continuous hot mix plant—*that* is the Mixall. Its range of usefulness extends throughout the field of road maintenance into small paving and resurfacing jobs. With the Mixall, municipalities, maintenance engineers and contractors need no longer resort to inferior cold patch material or be dependent upon the type of mix currently being produced by their local central plant sources.

Barber-Greene Company
Aurora, Illinois

Send me the descriptive 8-page bulletin on the Mixall.

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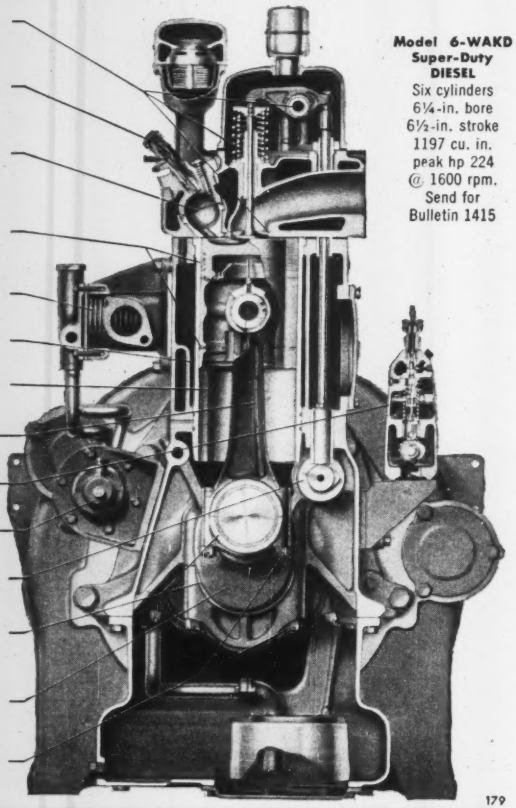

Dual springs, long guides. Pressure-oiled rockers. Stellite-faced valves and seats.

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Clean-burning combustion chamber removes from outside. Upper half water cooled, lower half air insulated to concentrate heat at throat.

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Hardened camshaft, single forging.

Hardened main and rod journals. Steel-back, tripe-element precision bearings, pressure oiled.

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Alloy-steel heat-treated rod and main bearing bolts.

Model 6-WAKD Super-Duty DIESEL
Six cylinders
6¼-in. bore
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1197 cu. in.
peak hp 224
@ 1600 rpm.
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WAUKESHA MOTOR COMPANY, WAUKESHA, WIS., NEW YORK, TULSA, LOS ANGELES

MUNICIPAL

Second floating bridge is planned for Seattle

Choice of a route for a second Lake Washington floating bridge east of Seattle, Wash., has been narrowed to two locations, Charles E. Andrew, chief consulting engineer for the Washington Toll Bridge Authority, has revealed.

The two routes are about half-a-mile apart, approximately 3.75 mi north of the present structure. The most favorable crossing, extending southeasterly from the south point of Union Bay in Seattle, would cost an estimated $12.4 million including approaches. This would best serve Seattle's north end but would involve an approach highway through park property, sure to meet protests from park lovers.

An alternate crossing, slightly to the south, would cost $300,000 more but would provide more direct access to the Seattle business district. A bridge at either location would be four lanes wide, about 7,600 ft long, of concrete pontoon construction.

A second bridge will be required across the lake within a few years "should the traffic continually increase at its present rate, and there is every evidence that it will do so at an accelerated rate," said Andrew. Feasibility of financing is expected to be considered soon by the toll bridge authority.

Completion of the first bridge in 1940 was a big factor in developing the area across Lake Washington from Seattle as a residential area. Since Puget Sound west of Seattle can be crossed only on expensive ferries, homebuilders previously had been forced to choose between sites increasingly farther to the north or south.

Growth of the east side has been particularly rapid since the removal of tolls from the bridge several years ago. Traffic across the bridge last year increased 8.4% to an average of 22,000 cars every 24 hours.

Whereas the existing bridge best serves Mercer Island, the new bridge would be of greatest service to residents in communities north of the island on the east shore of the lake.

Financing of the new bridge would be relatively simple were the present bridge not toll-free. Authorities doubt that many motorists would pay a toll on a new bridge when they could cross free by driving a few extra miles. Reimposition of tolls on the old structure would be politically unpopular, although a low toll on both bridges would pay off the construction cost of the new structure in a comparatively few years.

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. . . It's Kaylo Roof Tile — Lightweight, Strong, Insulating and Incombustible!

Kaylo Insulating Roof Tile is hydrous calcium silicate—the lightweight structural material that offers numerous advantages. Although Kaylo Tile *exceeds* the strength requirements for typical roof loads, a Kaylo roof deck weighs *only* 6 pounds per square foot. This means lighter foundations, a lighter supporting structure . . . substantial savings of structural steel.

The insulating value of Kaylo Tile, equal to one and one-half inches of standard insulation board, saves on heating and cooling costs. Since Kaylo Tile is incombustible, it offers protection against fire. The tile resists moisture damage and it is rot-proof.

A Kaylo roof deck also forms a completed ceiling. The tile's near-white underside reflects light and requires no painting. Kaylo Tile is easily handled and placed, thus saving construction time.

These are just a few of the facts to show Kaylo Insulating Roof Tile's ideal combination of qualities—advantages which offer you economical construction, permanence and all-around satisfaction.

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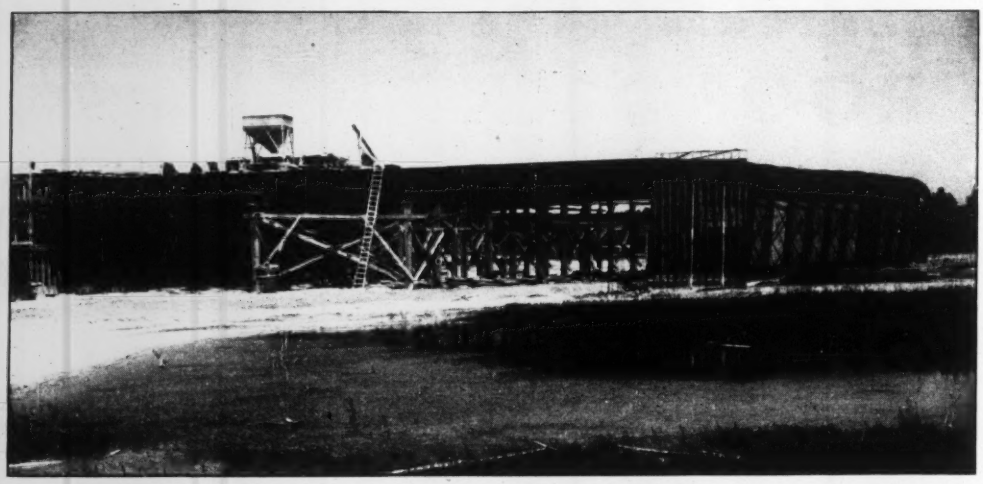


A RIGID-FRAME STRUCTURE is to carry the throughway over the present divided highway to Barrie, Ont., at the east end of the present work. Erection of steelwork had to be planned to permit traffic movements in both lanes on the Barrie road.

First section of Toronto throughway to be in service this summer

Early this summer the first stage of a $12-million throughway across the northern part of the metropolitan area surrounding Toronto, Ont., will be put into service. Nearly seven miles long, it will extend from Weston Road easterly to the present highway to Barrie, Ont., which is a main route to the summer resort region east of Georgian Bay. When the entire project is completed, the throughway will have a length of 20 miles and will provide a bypass around the city for east-west traffic.

Main reason for building the section now nearing completion as the first stage of the project was to provide better facilities for east-west traffic movements through a rapidly developing region where the older roads are inadequate. As the new highway intercepts the main north-south streets and has interchanges with them, it is currently being called the "Toronto Interceptor Throughway."

Next on the schedule is a three-mile extension westerly from Weston Road to Highway 27. When that part goes into service, the new throughway will provide a convenient route by which tourist travel from Buffalo or Detroit can reach the present Barrie road without entering the city. And when the new 60-mile express highway to Barrie is built (see map) an even easier route will be available.

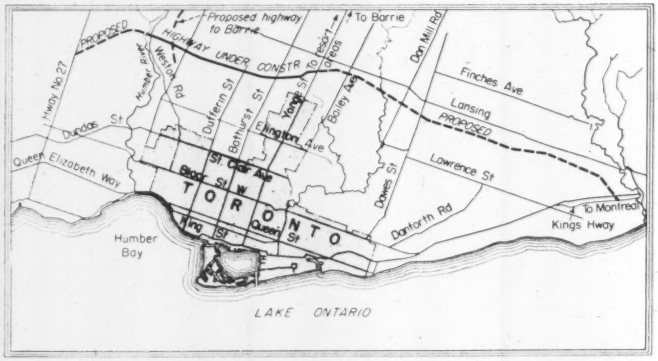
At the time this extension to Highway 27 is built, Highway 27 will be widened and converted into a divided highway from the junction point to Queen Elizabeth Way, which is the main highway from Niagara border.

The new throughway is to be a controlled-access highway. There will be seven separated intersections with existing main streets on the section now being built, with interchange lanes at each point to facilitate cross-city traffic movements, as noted previously.

An eastern extension to a connection with the King's Highway 2-A near the Rouge River will be built.

Contract for the current work other than paving is held by C. A. Pitts, General Contractors, Ltd., Toronto. Bids on paving will be called soon.

This project is being carried out by the Ontario Department of Highways, of which C. H. Nelson is chief engineer. Principal engineer on the project is A. Flintoff.



A SEVEN-MILE section of bypass around Toronto is being built now to facilitate communication between main north-south streets in the rapidly developing industrial and residential areas lying to the north of the city.

FARMS THAT "GROW" CONCRETE TO BUILD A STRONGER AMERICA

Two of the strangest farms in America "grow" concrete in northern Illinois and central Georgia. They are the Portland Cement Association experimental farms, where scientists study the effects of weathering on concrete in northern and southern climates.

"Growing" here are better pavements for defense highways, stronger runways to resist the impact of huge commercial and military planes and the terrific heat of jets, walls with greater resistance to the elements for factories, schools, hospitals, homes, hangars, warehouses, stores and public buildings.

"Plantings" made on farms, starting in 1940, consist of rows of concrete slabs, posts and boxes which simulate pavements, structural columns and walls. Specimens contain different proportions and combinations of materials used in making concrete.

Research like this is a continuing and expanding activity of the Portland Cement Association. Out of this research comes technical information on the best concrete mixtures and the best construction practices for building structures exposed to all conditions of service and weather.

Such information is made public immediately and freely through the Association's field engineering service and its educational and promotional program which is made possible by the voluntary financial support of its 68 member companies.

Thus the knowledge gained in the laboratory and in field tests can be used quickly by architects, engineers and contractors in designing and building more durable and ***lower-annual-cost*** facilities needed for our general economy and the defense program.

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A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

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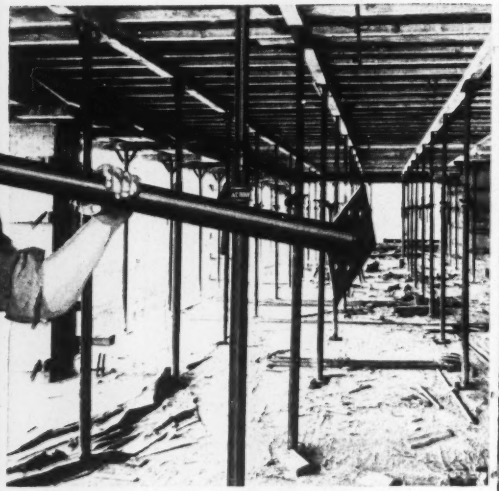

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Stripping goes faster, too—just a twist of the collar handle and ACROWS are down . . . ready to telescope compactly for easy transport to the next job or for space-saving storage.

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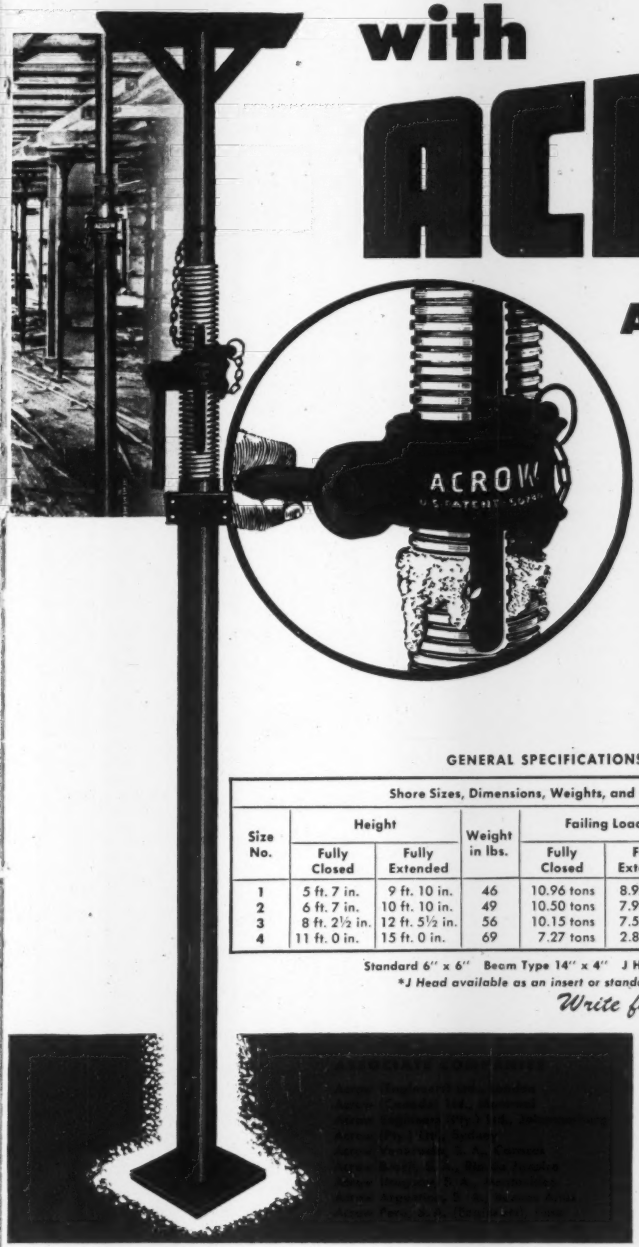

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ACROW Steel Shores are engineered and built from base to head for the fastest, safest, securest support on the job. Completely positive simple action leaves no chance for slippage. There is no cutting, wedging, or nailing to eat up time and money. And ACROW Shores have no jacks, levers, or supplementary tools to lose.

EXCLUSIVE ACROW SELF-CLEANING FEATURE makes possible rapid stripping operations. A unique patented extension of the collar nut extends over a segment of the threaded tube (see left). When collar handle is turned in stripping operation, encrusted concrete, dirt, and grit are removed from the thread—making ACROWS instantly ready for use on the next job.

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Shore Sizes, Dimensions, Weights, and Capacities							
Size No.	Height		Weight in lbs.	Failing Load		Recommended Safe Working Load	
	Fully Closed	Fully Extended		Fully Closed	Fully Extended	Fully Closed	Fully Extended
1	5 ft. 7 in.	9 ft. 10 in.	46	10.96 tons	8.97 tons	8210 lbs.	6720 lbs.
2	6 ft. 7 in.	10 ft. 10 in.	49	10.50 tons	7.90 tons	7840 lbs.	5975 lbs.
3	8 ft. 2½ in.	12 ft. 5½ in.	56	10.15 tons	7.55 tons	7490 lbs.	5600 lbs.
4	11 ft. 0 in.	15 ft. 0 in.	69	7.27 tons	2.89 tons	5225 lbs.	2050 lbs.

Standard 6" x 6" Beam Type 14" x 4" J Head 14" x 4"*

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FIFTEEN SPANS—In Brazil's Galeao Bridge 15 spans of prestressed concrete construction are used. The longest span is 142 ft.

Prestressing surveyed in Latin America

The use of prestressed concrete in Central and South America will parallel or surpass its use in the United States, while factory mass production of small prestressed items seems certain to exceed by far the output here.

These conclusions are based on a recent survey of prestressed concrete in ten Latin American countries conducted by McGraw-Hill World News correspondents for INGENIERIA INTERNACIONAL CONSTRUCCION.

• **What they are doing**—As in the U. S., it is only during the last five years that Latin Americans have taken to prestressed concrete in earnest. But even in that short time, the list of prestressed structures and parts has become impressive.

In Brazil, for example, three long-span prestressed concrete bridges have been erected, and currently under construction are three others, also a dam 1,300 ft long and 40 ft high tied to the foundation with vertical stressed cables, and most recently a balcony in a motion-picture theatre.

Argentina is taking the lead in setting up factories to produce prestressed concrete items. Two facilities are already producing, one turning out beams and tiles for roofing and flooring, the second, high-strength tubes and pipe. Four other plants are now being built, three to manufacture beams, posts and tubes, while the fourth is going to exploit the Swiss patent for Stahlton prestressed tile flooring.

In Peru, bridge beams and decking, and mullions for large windows have been prestressed. Chile has used prestressing for power line posts, and also has a long-span bridge under construction.

The International Bridge between El Salvador and Guatemala is of prestressed concrete, as are the unusually long-span arch bridges on the new LaGuaira-to-Caracas highway in Venezuela. The largest of these spans is 510 ft. In Mexico, more than a quarter-mile of prestressed railroad ties have been laid. In Cuba, three prestressed highway bridges are now being built.

• **Economic factors**—Different combinations of material-supply and price situations hold the key to prestressing growth in each country. In general, those countries in which reinforcing steel and cement are scarce or high-priced will use prestressed concrete in place of ordinary reinforced concrete. The lesser amounts of high-quality steel and high-strength cement required for prestressed concrete make it more economical.

However, a bigger potential lies in replacing other more expensive construction materials, such as lumber, structural steel, cast iron and various roofing tiles. Practically all Latin American republics suffer from shortages of one or more of these, a situation which favors more factory mass production of prestressed concrete items than in the U. S. Thus, even where reinforcing steel and cement are in good supply, prestressing has a bright future.

(*International continued on page 78*)

Use JOY AIR-POWER and TOOLS

for all-around best performance

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JOY Portable Compressors and "Silver Streak" Air Tools make a highly efficient, time-and-money-saving team—the most modern units you can put on the job. They're light, compact and easy to handle, yet ruggedly built for real heavy-duty service. JOY Portables are available in seven sizes, ranging in capacity from 60 to 630 CFM at standard pressure. JOY Air Tools feature the exclusive "Dual Valve" that makes air do more work, plus cadmium plating for better lubrication, closer tolerances, and prevention of rust and scoring. • Let us show you how JOY equipment can reduce your costs, and produce more work per man-hour. *Write for bulletins, and ask for an actual demonstration.*

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JOY K-81, a rugged tool capable of sustained operation on the heaviest demolition work.

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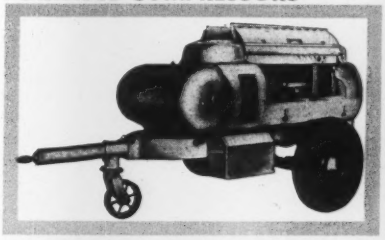
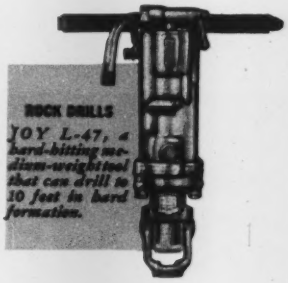
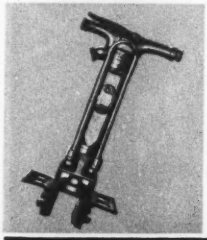




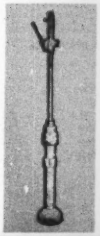
ROCK DRILLS

JOY L-47, a hard-hitting medium-weight tool that can drill to 10 feet in hard formation.



SHEETING DRIVERS

JOY Q-81, an adaptation of the K-81 for driving wood or light steel sheeting.



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JOY M-2, a light tool for digging in clay, shale, hardpan, or hard-frozen ground.

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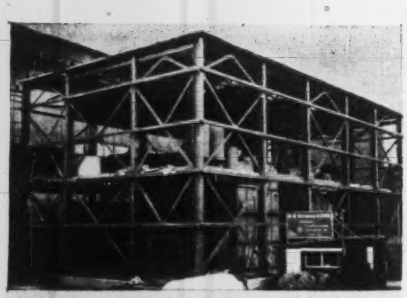


STRUCTURAL STEEL framework of the building, ready for installation of insulated Stainless Steel panels.

PROTECTIVE PAPER covering that kept the panels completely damage-free during fabrication and shipment is removed with a commercial preparation.

ON THE GROUND, panels are drilled for bolts which are used in erection. Two holes are positioned at the top and two at the bottom of each panel.

THE 24" WIDE Stainless panels backed with 1½" Fiberglas insulation and metal-coated steel inner plate are attached to the building's structural members by four ½" x 3" round-head Stainless Steel bolts.

MORE than 7,000 square feet of U·S·S 17 Stainless Steel insulated panels form the complete walls of this new building which is an addition to existing steam generating facilities at the jet engine overhaul line at Olmsted Air Force Base, Middletown, Pa.

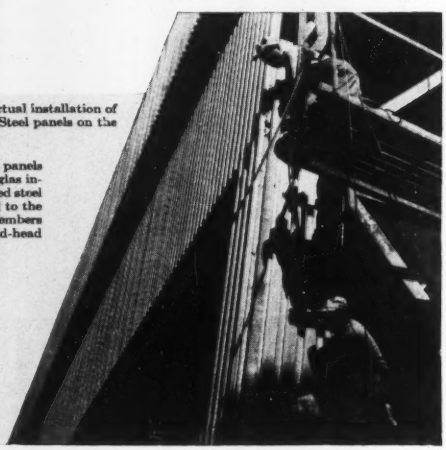
These Stainless Steel panels were installed by a crew of eight men in only 11 working days. One group of four men removed the protective paper and drilled the panels, and a second group of four drilled the girts and bolted the panels into place.

Quick installation like this—*in any weather*—means much lower labor costs. And that's but a part of the dollars-and-cents advantage of using Stainless Steel panel construction.

In the long run, the durability and corrosion resistance of Stainless Steel walls, the light weight in comparison to conventional building materials, the low "U" value or heat transmission factor all indicate that the cost-per-year will be lower than many building materials that may have a slightly lower initial cost.

Best news of all is that U·S·S 17 Stainless Steel for walls is available *now* for use on your current projects. You can obtain it without CMP tickets for use on any authorized construction.

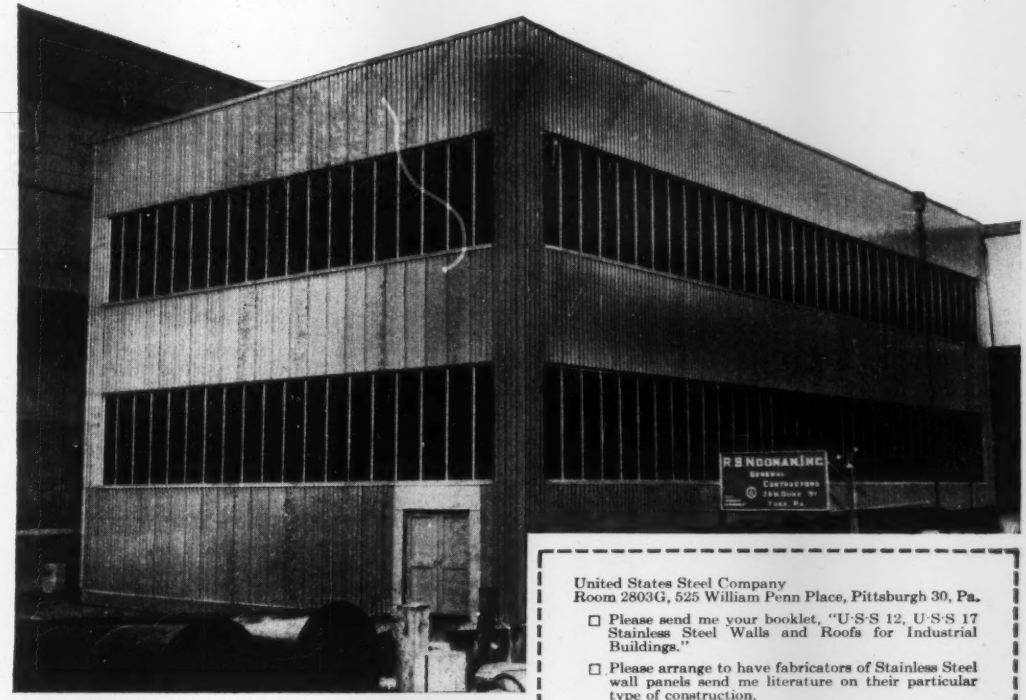
No matter what type of building you have in prospect—factories, mills, warehouses, power plants, service or office buildings—U·S·S 17 Stainless Steel deserves your careful consideration. If you'd like additional information, write for our book, using the coupon below. Remember, United States Steel only produces the Stainless sheet and strip from which panels of this type are made; the panels themselves are fabricated by a number of our customers whose names will be sent you on request.



TWO MEN handle actual installation of insulated Stainless Steel panels on the building.

LONG-LASTING, INSULATED BUILDING PANELS

U·S·S 17 *(Type 430)* Stainless Steel installed in 11 working days



NEARING COMPLETION in this photograph is this addition to steam generating facilities at Olmsted Air Force Base, Middletown, Pa. The 86½' by 46' building is sided with panels of U·S·S 17 Stainless Steel. Architect-Engineer: Gannett, Fleming, Corddry & Carpenter, Inc., Harrisburg, Pa. General contractor: R. S. Noonan, Inc., York, Pa. Stainless Steel panels fabricated and erected by H. H. Robertson Co., Pittsburgh, Pa.

United States Steel Company
Room 2803G, 525 William Penn Place, Pittsburgh 30, Pa.

- ☐ Please send me your booklet, "U·S·S 12, U·S·S 17 Stainless Steel Walls and Roofs for Industrial Buildings."
- ☐ Please arrange to have fabricators of Stainless Steel wall panels send me literature on their particular type of construction.

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Address.....

City..... State.....

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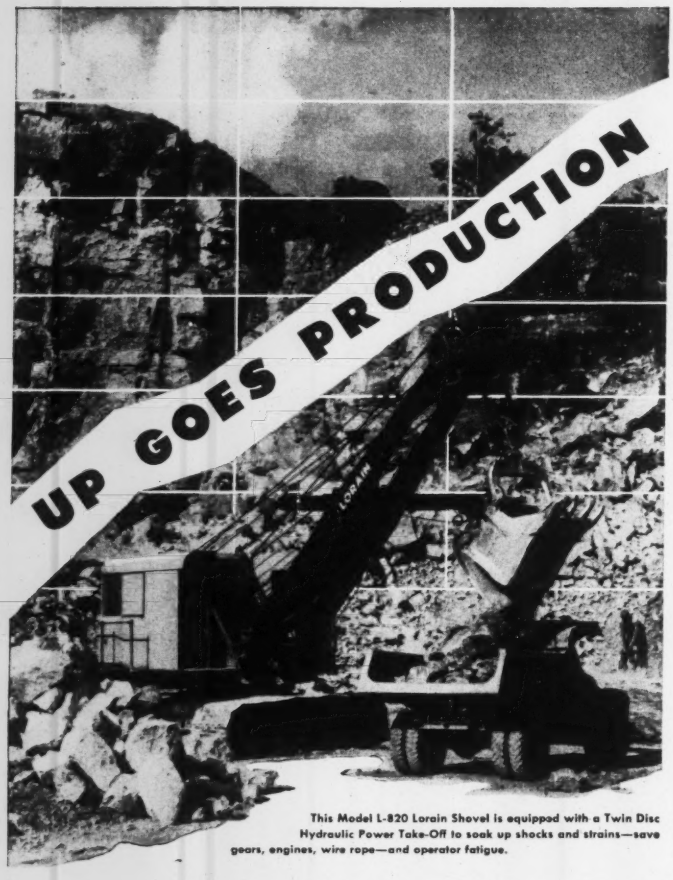
UNITED STATES STEEL



This Model L-820 Lorain Shovel is equipped with a Twin Disc Hydraulic Power Take-Off to soak up shocks and strains—save gears, engines, wire rope—and operator fatigue.

Industry produces more and more because it gets more out of its power—because with the increased use of powered equipment new and better methods have been developed to put these machines to work.

Whether it's in producing more coal or other minerals—or moving dirt quicker—today's mammoth shovels perform most efficiently when Twin Disc friction clutches or hydraulic drives transmit the power.

Ever since World War I Twin Disc has worked with industry in improving the driving mechanisms of productive machinery. That's why, today, Twin Disc units are used in leading makes of all kinds of industrial machines—metal working, textile, chemical, logging, construction, fishing, petroleum, farming—and mining.

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INTERNATIONAL

• **Many problems**—Before prestressing can live up fully to its great possibilities, many problems have to be overcome—some general, others local.

The most important, existing everywhere, is engineers' and contractors' lack of familiarity with the process. Emergence of technical journals entirely devoted to prestressed concrete and increased attention given to it by older technical publications is correcting this condition to some extent. Each new structure, of course, adds to existing knowledge.

So far, most local codes fail to take prestressed concrete into account, but this too, should be corrected when engineers are convinced of its capabilities.

Bidding procedures are also an obstacle. In some places no detailed engineering drawings are made until after a contractor has been awarded the job. He is then not prone to try anything new like prestressed concrete.

• **Techniques used**—There is general agreement among all experts interviewed in Latin America that the Hoyer system should be used for mass production. Lack of expensive end anchorages is felt to be the important factor.

On the other hand, end-anchorage systems are agreed best for large elements cast on the job or at a temporary central location. Some prefer the Magnel or Freyssinet wedge-type anchorages, while others like large-diameter cables with threaded end fittings.

Foreign engineers coming to Engineering Centennial

Decision of the Mutual Security Agency to utilize the importance of the Centennial of Engineering, scheduled in Chicago this summer, to bring 200 leading European engineers to the United States to study American production methods, has been announced by the Centennial's president Lenox R. Lohr.

The foreign group is expected to arrive in the United States well in advance of the official opening of the convocation part of the Centennial program on Sept. 3. Present plans call for the foreign visitors to spend at least five weeks in this country. Following participation in the Centennial convocation, they will tour America's leading cities and production centers as well as other areas with key engineering installations. Main objectives will be to give them every possible opportunity to observe American methods of design, construction and operation of

(*Continued on page* 82)

The direct-process prints and blueprints received from vendors are reproduced on Autopositive Paper when extra copies are needed for the drafting room or shop. Deletions and additions can be made readily on Autopositive intermediates . . . saving drafting time.

Drawing Reproduction Revolutionized

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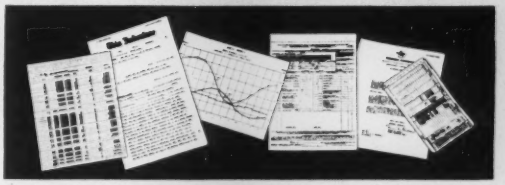

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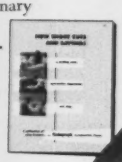

67

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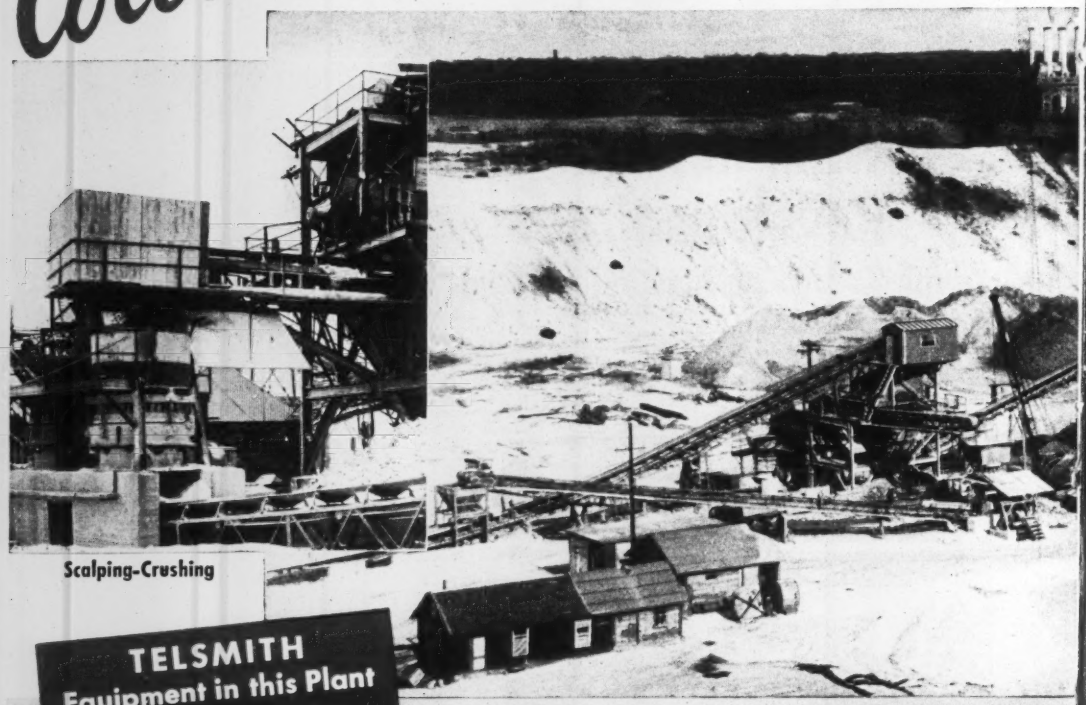

Scalping-Crushing

TELSMITH Equipment in this Plant

Two 5′ x 14′ Two-Deck Heavy-Duty Scalping Screens

Two 48-S Gyrasphere Crushers

Eight 4′ x 10′ One-Deck Vibro-King Dry Screens

Four 4′ x 14′ Two-Deck Vibro-King Wet Screens

Four 60″ x 9′ Super Scrubbers

Eight 4′ x 10′ One-Deck Vibro-King Wet Screens

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GS-21

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Production averages about 1000-1200 tons per hr., making four kinds of material: minus 1½″ plus ¼″ crushed and uncrushed gravel mixed, minus ¼″ plus ⅛″ grits, minus ⅛″ sand, all washed; and minus ⅛″ dry sand. Most of the material is loaded into barges for shipment to New York. A truck-loading plant handles local demands.

In Scalping-Crushing Unit, two 2-deck Pulsators are in closed circuit with two 48″ Gyrasphere Crushers which reduce all gravel to minus 1½″. In the Dry Screening Plant eight special Vibro-King Dry Screens produce the dry sand. Scrubbing-Washing-Sizing Unit has two batteries of Vibro-King Wet Screens—two-deckers ahead, with single-deckers following the Super Scrubbers. Get Bulletin 266 describing Telsmith Complete Plant Service.

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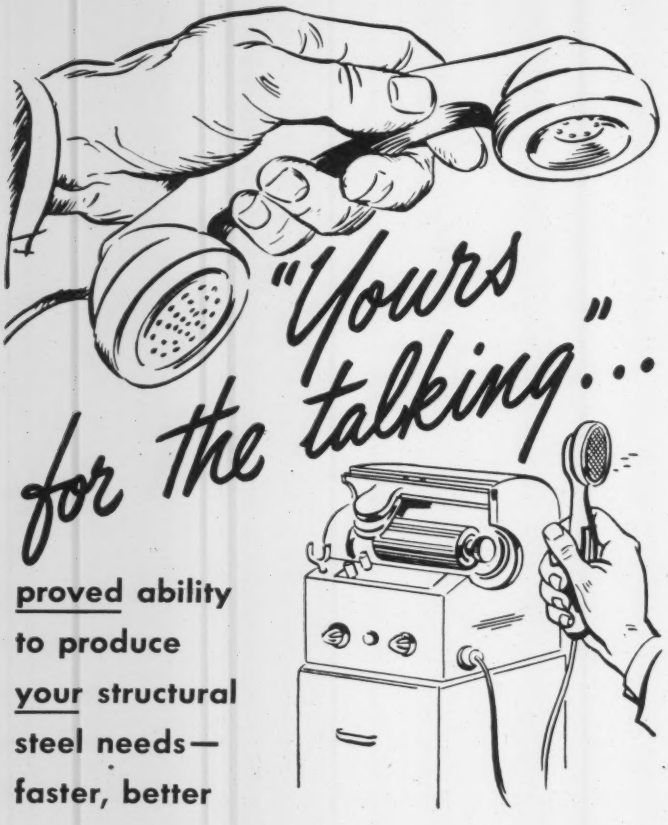

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engineering works, mass production and distribution; and the roles of engineers, labor and management in the productivity of the United States.

In addition to the above representation, at least 15 foreign nations will participate officially in the centennial. The largest delegation announced so far will come from the Engineering Society of Norway, consisting of 17 members.

The Royal Society of Industrial Engineers, Belgium, will have an 11-man delegation, and a large group will represent Great Britain's civil, electrical and mechanical engineers.

Japan's delegation will be headed by Takeo Fukuda of Tokyo University, vice-president-elect of the Japan Society of Civil Engineers. France's group will be headed by Georges Darrieus, president of the French Society of Civil Engineers and member of the French Academy of Science.

Other countries with assured representation of their leading scientists and engineers are The Netherlands, Switzerland, Italy, India, Canada, Mexico, Cuba, Peru and Uruguay.

Contract has been let for Halifax harbor bridge

Dominion Bridge Co. has been awarded the contract for the fabrication and erection of the superstructure of a 1,447-ft. span suspension bridge across Halifax Harbor in Nova Scotia for The Halifax-Dartmouth Bridge Commission.

Side spans will be 526 ft., the towers 309 ft. high, and the clearance under the main span 165 ft. The total weight of the steelwork will be approximately 8,200 tons.

The new bridge will have a slightly shorter span than that of the Lion's Gate Bridge in Vancouver, B. C., the longest in Canada.

P. L. Pratley of Montreal is the consulting engineer with C. A. Fowler & Co. of Halifax, associate engineers.

Completion of the entire $8 million project is scheduled for 1954.

India is constructing new west coast seaport

India is constructing a new major seaport on its west coast to replace the loss of Karachi to Pakistan in 1947. The new port, known as Kandla, is to take three and a half years in building. Estimated cost is thirty million dollars. Kandla is situated at a sheltered spot in the Gulf of Kutch in the extreme western corner of India, not far from the

(Continued on page 85)

P&H STABILITY

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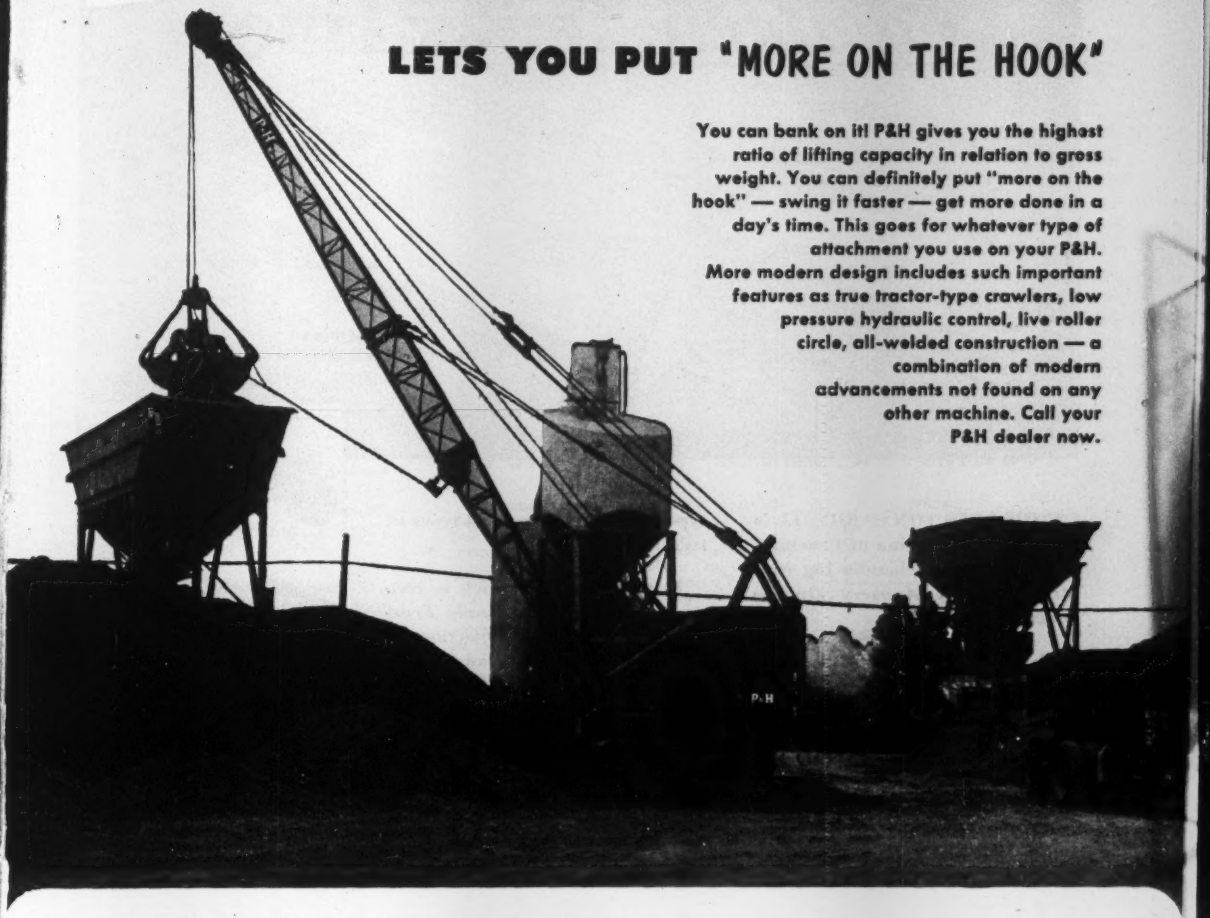

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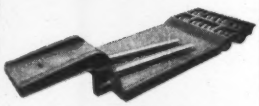
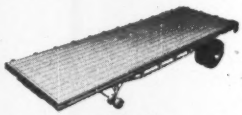
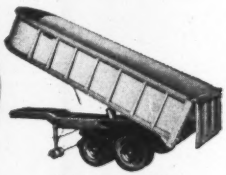


DOUBLE DROP CARRYALLS



PLATFORMS

BULK CEMENT TRAILERS



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Pakistan boundary. It is anticipated that Kandla will relieve pressure on ports such as Bombay, Madras, Cochin, Vizagapatam and Calcutta which are now handling twenty million tons of shipping per year.

The creek where the port is being built will be able to accommodate large ocean-going vessels. It is a natural harbor, and will require no breakwaters.

When completed the port will have four deep-water cargo berths served by three railway lines and equipped with modern cranes and handling equipment. Construction plans include three transit sheds and four two-story warehouses.

Initially, the port is expected to handle 450,000 tons of general cargo and 400,000 tons of oil per year. It will serve Delhi and northwestern India.

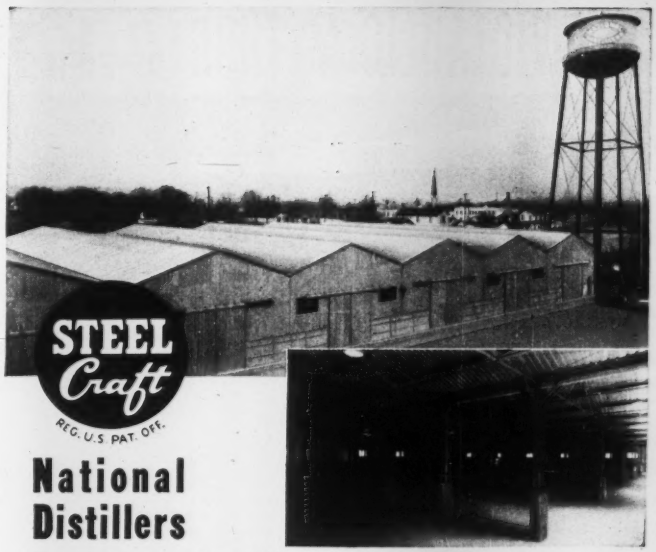
International Briefs

• **New runways for Egyptian airports**—The Egyptian Civil Aviation Department is planning construction of two new runways for Alexandria's Fuad International Airport and one for Cairo's Farouk Airport. The runways will be capable of receiving the world's heaviest planes and jet airliners.

• **Higher costs for Bolivian road**—Raymond Concrete Pile Co., consulting engineers overseeing construction of about 188 mi of the Cochamba-Santa Cruz highway in Bolivia now estimate that the total cost of the project will be $27 million, which is $3 million more than the original estimate. Export-Import Bank is advancing $16 million and the Bolivian government the other $8 million.

• **French steel**—Sollac, a combine of nine French steel companies, is building a fully integrated steel works (except for blast furnaces) from open hearth to sheet finishing mills at Hayange and Etange, a few miles from the Saar and Luxembourg and close to extensive iron-ore and coal-mining areas. The plants, to cost eventually $147 million, will employ 3,500 workers and will add materially to the defense production of the free world. The MSA has just announced an $8,474,000 authorization for the Sollac steel combine.

• **Havana aqueduct**—It is announced that work will begin immediately on enlarging and renovating the Albear Aqueduct at Havana, Cuba. For this work the National Development Commission has set aside $9 million.



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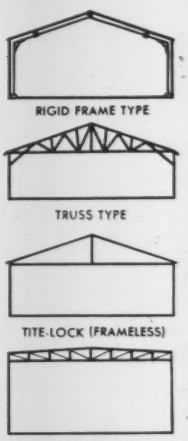

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INTERNATIONAL

Total cost will be $12 million, the last $3 million being supplied by adjacent land-owners.

• **Canadian airports**—The government of Canada will spend more than $7 million during this fiscal year to develop civilian airport facilities across the dominion. Runways will be extended at Gander, Regina, Grand Prairie, Prince George, and Vancouver, and terminal facilities at Moncton, Ottawa, Fort William, Saskatoon and Winnipeg.

• **Helping Ethiopia**—Thomas H. MacDonald, commissioner of the U. S. Bureau of Public Roads, is in Ethiopia in connection with a technical assistance mission aiding in highway developments for that country.

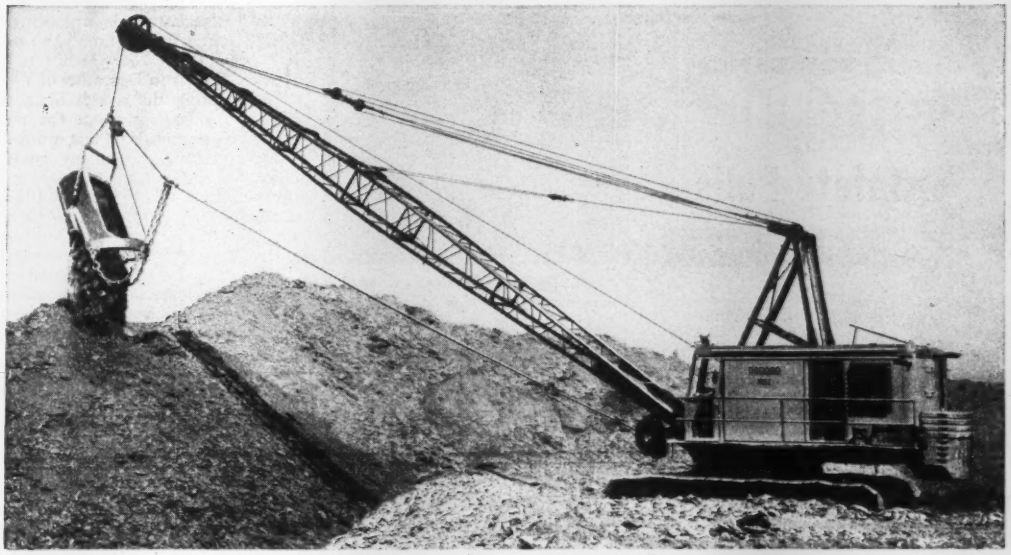
• **New Russian canal**—The waters of the Don River are getting closer to the Volga River through the new Don Canal now near completion. When it is finished it will be possible to travel by boat from the Black Sea to the White Sea across Russia. The canal will also connect the Caspian with the Black Sea.

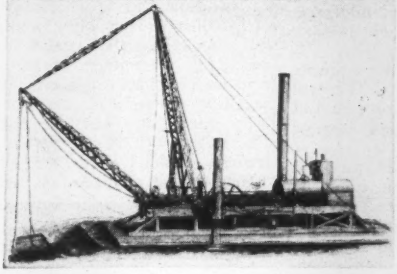
• **Lydda Airport**—Lydda Airport (known abroad as Lod) in Israel is soon to be reclassified "B" with the completion of the extension of its main runway, and technical improvements. Work is in progress on the construction of a large aircraft maintenance base, to be erected and managed by the government with the cooperation of a group of American experts, headed by Al Schwimmer.

• **Aswan Dam finances**—The Egyptian Council of Ministers has approved a decree-law raising the credit for the Aswan Dam hydro-electric scheme from $70 million to over $78 million. This sum will be taken from the reserve fund and will be repaid by a later public loan. The plan for the dam is now under study by Negib el-Hilali Pasha, Egyptian premier. The minister of public works is of the opinion that Egypt does not need a foreign loan for large irrigation projects.

• **MSA funds for Europe**—Total allotments of funds by the Mutual Security Agency to European countries so far this fiscal year amount to $1,422,025,000. Allotments are made to permit the participating countries to plan their dollar import programs.

A CENTURY OF EXPERIENCE BACK OF EVERY OSGOOD





FIRST SUCCESSFUL DRAGLINE

1884 brought the development, by OSGOOD, of the first successful dragline . . . a far cry from modern OSGOOD giants, but far ahead of anything in its day.

In the highly specialized manufacture of excavating and materials handling equipment, there's no substitute for experience. That's why size for size, modern OSGOOD machines outperform any others built. Every OSGOOD is backed by a century of experience dating from the first machine built by Jason C. Osgood in 1852. And every OSGOOD feature is specifically engineered to give you more for your money. Don't buy any digging or materials handling equipment till you've seen how these modern OSGOOD machines are built to speed job time, reduce maintenance and operating costs, and give you longer service. Write today.

MEMBER PCSA

EQUIPMENT DESIGNED WITH YOUR PROFIT IN MIND

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The OSGOOD COMPANY

MARION, OHIO

AFFILIATED WITH THE GENERAL EXCAVATOR CO.

POWER SHOVELS, CRANES, DRAGLINES, CLAMSHELLS, PILE DRIVERS & HOES. CRAWLER, TRUCK OR WHEEL MOUNTED. DIESEL, GASOLINE OR ELECTRIC POWERED. CAPACITIES ½ TO 2½ CU. YD.

YOU GET IN

COFFING

Safety-Pulls

Extra Safety

You can depend on Safety-Pull Ratchet-Lever Hoists to fully protect men and equipment. They are factory-tested at 100 per-cent overload. With dual ratchet and pawl, load cannot slip or drop. Hooks are specially designed, alloy steel — will not break or straighten out.

Coffing Safety-Pull Ratchet Lever Hoists
Ten models—capacities from 1,500 lb. to 15 tons.

Low-Cost Maintenance

Heavy-duty construction keeps Coffing Safety-Pulls on the job...out of the repair shop. Hoist frame and handle are certified malleable iron. Sprocket and ratchet are special alloy, heat treated for longer life. These and other construction extras keep Safety-Pulls working under hard, continual use.

For more information on Safety-Pulls and other products listed below, write Dept. EN6SP.

COFFING HOIST COMPANY
DANVILLE, ILLINOIS

Hoist-Alls • Mighty-Midget Pullers
Spur-Gear Hoists • Differential Chain Hoists • Load Binders • I-Beam Trolleys
Quik-Lift Electric Hoists

SOLD BY DISTRIBUTORS EVERYWHERE

FRANKLIN D. RICHARDS, resigned as Commissioner of FHA, after 17 years.

FHA head resigns; had served 17 years

Franklin D. Richards resigned last week as commissioner of the Federal Housing Administration after seventeen and one-half years of government service. The resignation takes effect June 30.

During his five years as Commissioner of FHA, the administration insured 17 billion worth of mortgages on more than three million dwelling units.

Richards resigned to enter a private firm in Washington, D. C. He will specialize in mortgage brokerage and financing of housing and housing projects.

Richards left FHA with a kind word and a friendly smile from the President and with a clean record as an administrator. Although threatened many times with an investigation, FHA, under Richard's administration, suffered no scandals and provided few headlines. Richards kept a staff of investigators ever on the alert, and the first rumor of peccadillos brought an investigator to the scene for a quick analysis and report.

Richards first entered the Federal Housing Administration in 1934. As Utah's first FHA State Director. After six years at this post he became Zone Commissioner for eleven western states, Alaska and Hawaii in 1941. He served as Assistant Commissioner, field operations of FHA in 1946 and 1947. In 1947 he became Commissioner.

Professional engineers make second award

D. B. Steinman, bridge consultant and past president of the National Society of Professional Engineers received the award of the society at Tulsa, Okla., last week.

This is the second time the award has been made; the first was to Herbert Hoover in December of 1949.

In accepting the awards Steinman told of his feelings about the engineering profession, in these words:

"It has always been my guiding creed that every man is a debtor to his profession. That is why I have dedicated my strength, my energy, my life—to the advancement and glory of the engineering profession. That is why I have consecrated myself and whatever talents I possessed, and have given freely of all that I had, without counting the sacrifice or the cost. And that is why, when I look about me tonight and see this visible consumation of all my dreams, I feel more than fully repaid.

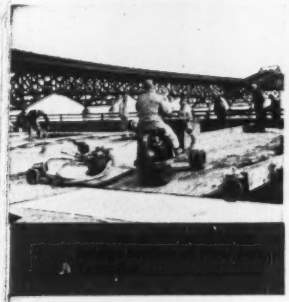
"It was relatively only a few years ago—actually in 1934—that all of this was only a dream. We dreamed of a national organization of, by and for all engineers—dedicated to a great cause, a defined, integrated and unified engineering profession.

"We now have a national society of 25,000 members, with 38 member state societies, 250 local chapters, and 2500 committees of engineers. And we now have engineers' registration laws enacted and functioning in every one of our 48 states and the District of Columbia, and in every territory of the United States.

(*Men and Jobs continued on page 92*)

D. B. STEINMAN, second engineer to receive the award of the NSPE.

TREMENDOUS JOB



"Our Whiteman Power Buggies are tireless workers. All day long they speed along the runways, climb steep grades, squeeze through tight spots and turn on a dime. They're doing a tremendous job, saving valuable time and cutting costs —for the simple reason they carry 13 cu. ft. of concrete at a time, which is equal to 4 hand buggies. For bridge slabs and floors, they are tops."

Larry O'Neill, Supt.
c/o Poirier & McLane Corp.

Climbs 25% grades with ease.

Positive "in-gear" mechanism of dump and return.

Also available with dumping stake-type body.

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

WHITEMAN MFG. CO., DEPT. E
3249 Casitas Ave., Los Angeles 39, Calif.

Please send prices, literature and name of distributor for____Power Buggy____Screeding Machines____Floating Finishing Machines.

Name_____

Firm_____

Address_____

City_____ Zone____ State_____

NEW ALLIS-CHALMERS HD-9, HD-15 ARE built to GET MORE DONE

THE NEWEST, FINEST LINE ON EARTH!

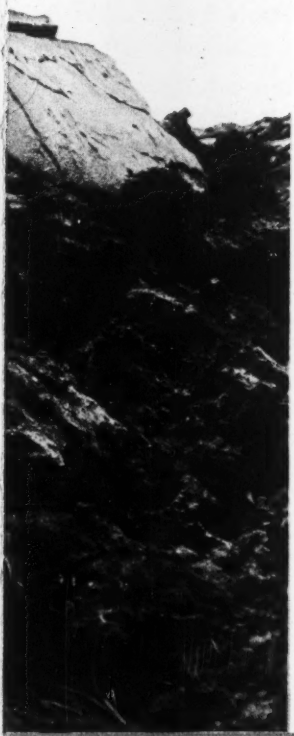
HD-5
40 drawbar hp.
11,250 lb.

HD-9
72 drawbar hp.
18,800 lb.

HD-15
109 drawbar hp.
27,850 lb.

HD-20
Hydraulic Torque
Converter Drive
175 net engine hp.
41,000 lb.

built to TAKE IT LONGER



Unequalled Lugability

The HD-9 and HD-15 build up greater drawbar pull faster . . . hold it longer than ever thought possible in gear transmission tractors.

For example, when tough going has pulled travel speed down 40 percent, these tractors will have increased their drawbar pull almost 20 percent over rated pull. They will lug down almost 45 percent from rated travel speed before drawbar pull even starts to fall off.

To take full advantage of this important GM 2-cycle diesel engine characteristic, the HD-9 and HD-15 have longer truck frames, lower idlers and sprockets. That means more track on the ground . . . better stability . . . sure-footed traction . . . unequalled *lugability.*

Extra Long Life

Here are a few of the many reasons why these newest, finest tractors are *built to take it.*

- **All-Steel Welded Construction**
- **More Power with Bigger Engines — Longer Engine Life**
- **More Weight, Greater Strength**
- **Extra Heavy Main Frames — No Extra Reinforcement Needed for Front-Mounted Equipment**
- **Long-Lasting, Large Diameter Clutches**
- **Double Reduction, Straddle-Mounted Final Drive Gears with Live Sprocket Shafts and Caged Bearings**
- **Positive Operating Track Release — Works in Oil**
- **All New, Specially Designed Track Assembly**
- **Positive-Seal Truck Wheels, Support Rollers and Idlers — Mounted on Tapered Roller Bearings, 1,000-Hour Lubrication!**

Your Allis-Chalmers dealer will be glad to explain all of these advantages. See him or phone him now.

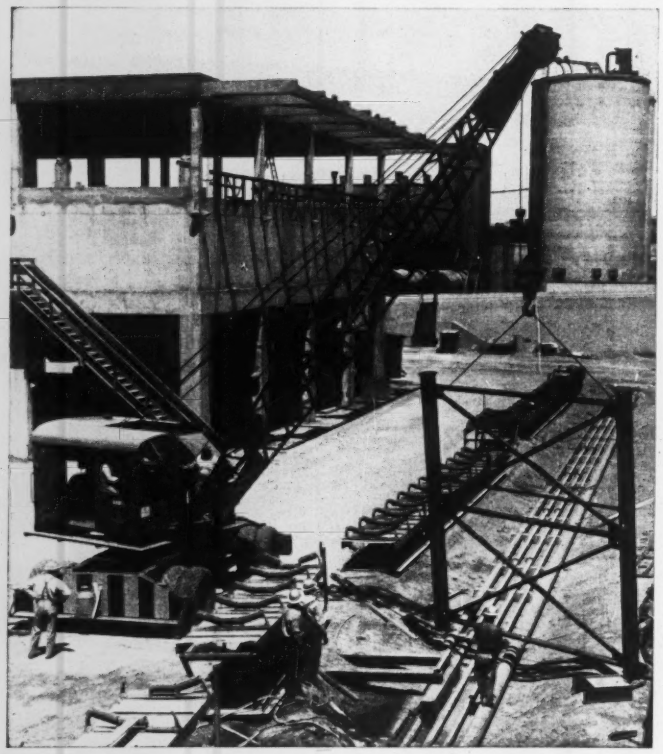
DESIGNED FOR YOUR JOB • BUILT TO "TAKE IT" • EASY TO OPERATE • EASY TO SERVICE

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

ANOTHER

MAXI-MOUNTED CRANE★



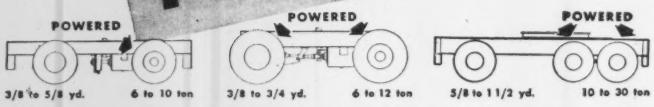
. . FOR THESE MAXIMUM ADVANTAGES:

- one-man control
- operation stability through 360°
- close quarter maneuverability
- fast travel—either direction

★ P & H 600 Crane, Maxi-mounted, setting steel at Las Vegas, Nevada.

Write for additional information.

MAXI® CRANE CARRIERS



ENGINEERED AND MANUFACTURED BY SIX WHEELS, INC. • LOS ANGELES 54, CALIF.

JAMES P. GROWDON, retiring chief hydraulic engineer for Alcoa.

Pay engineers more, says Alcoa's Growdon

"The way to end the shortage of engineers is to pay engineers more than you pay laborers."

That's James P. Growdon talking. And Growdon has a right to an outspoken opinion because of his nearly half a century of experience as an engineer and his accomplishments.

After more than 25 years association with the hydraulic engineering operations of Aluminum Company of America, Growdon recently retired as chief hydraulic engineer for Alcoa to become consulting hydraulic engineer.

Commenting on the engineer shortage, Growdon said:

"Now steelworkers earn more than young engineers. That isn't right. Until you cure that you'll have an engineer shortage . . ."

He explains another strong conviction about his profession this way:

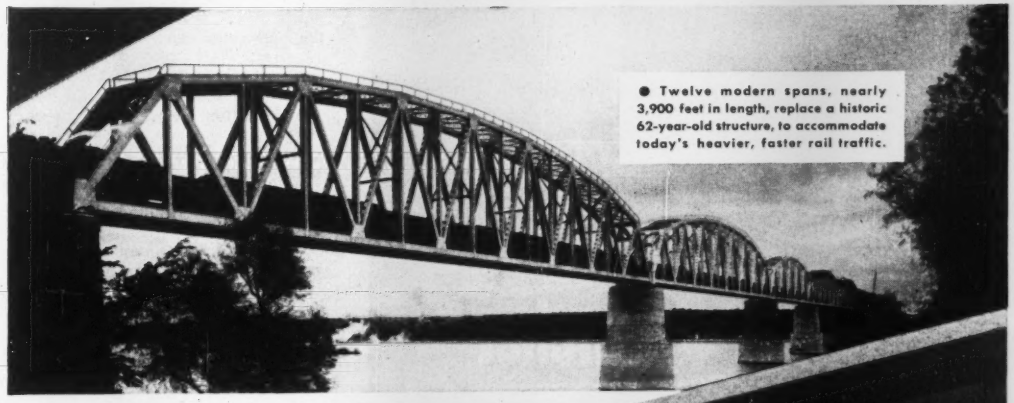
"One good engineer is worth a dozen mediocre ones on any job. Big engineering staffs aren't necessary to do big jobs. We've done work for Alcoa which some outfits would have done with three times as many men."

Growdon, himself, has done some big jobs almost single-handed with dazzling speed. Friends say his sensible, adequate and economical solutions of tough problems have passed into textbooks and professional lore.

For example, he gets a major share of the credit for adapting the vibrator principle to pouring concrete. That inovation came as the result of an inspection of Alcoa's Calderwood Dam in North Carolina in 1930.

One of the highlights of his career was the design of underground oil

(*Continued on page 94*)



● Twelve modern spans, nearly 3,900 feet in length, replace a historic 62-year-old structure, to accommodate today's heavier, faster rail traffic.

Illinois Central's $6,500,000 Bridge at Cai... protected by

PITTSBURGH'S NEW X-L-O STRUCTURAL - STEEL - PRIMER

XLO Steel Primer Gives You These 5 Important Advantages:

1. Unexcelled wetting properties insure uniform protective coating of steel surface irregularities caused by mill scale.
2. Controlled and positive drying permits shipment of fabricated parts to the job site within 24 hours after priming, in all seasons of the year.
3. Standard shop practice for thorough cleaning of metal surfaces before priming may be followed without impractical or costly methods of surface preparation.
4. Provides optimum protection against metal corrosion during shipment and erection; also serves as the foundation coat for the field painting system.
5. In addition to meeting ASTM Specification D-234-48 and Federal Specification TT-O-369 covering Raw Linseed Oil, XLO Structural Steel Primer provides a plus in drying over specification requirements.

ONE OF the most remarkable feats in modern bridge-building was the modernization of the Illinois Central's Ohio River bridge at Cairo, Ill., at a cost of $6,500,000.

● **This new structure** was fabricated and erected by the American Bridge Division, United States Steel Company. Twelve new spans, ranging from 197 to 518 feet in length, were erected alongside the earlier spans and moved into place on the old piers, with a minimum interruption of traffic. This spectacular task required nearly a year and a half.

● **During most of this period,** Pittsburgh's new X-L-O Structural Steel Primer, used as an initial protective undercoating, helped to safeguard these new steel spans against corrosion. This new kind of protective coating is derived from special linseed oil, combined with red lead and iron oxide pigments. It is also furnished with 100% red lead, if desired. A variety of IRONHIDE coatings, suitable for field application, is also available.

● **For further information,** write, wire or phone Pittsburgh Plate Glass Company, Industrial Sales Division, 2000 Grant Building, Pittsburgh, Pa., or any of the following factories nearest you.

PITTSBURGH PLATE GLASS CO., Industrial Paint Div., Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Atlanta, Ga.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Div., Detroit, Michigan. The Thresher Paint & Varnish Co., Dayton, Ohio. Forbes Finishes Division, Cleveland, Ohio. M. B. Suydam Division, Pittsburgh, Pa.

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the first...
the only perfected
open-end
ratchet
wrench!
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Right: Socket Type
For generations Tool Engineers have tried to develop a practical Open End Ratchet Wrench Now TAC has done it... both as a socket type and as a Crowfoot type.
And what a marvel TAC is! It ratchets in as little as 7° arc. It slips over and down on tubing or other standing center assemblies, tightens or backs off nuts or fittings, then slips off again... all in a mere fraction of the time otherwise required. Sockets cover the range from ¾" to 4"... and adaptors carry the tool's advantages over into Allen head, turnbuckle or screwdriver operations!
Proof of TAC's phenomenal performance throughout all Industry would fill volumes. Our plants are currently producing at capacity for all the Armed Forces and for Defense Industries.
The TAC Open End Ratchet Wrench is fully protected by Patent numbers 2578686 and 2578687, other patents pending. The name TAC is the registered trademark of TUBING APPLIANCE COMPANY
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10321 ANZA AVENUE
Los Angeles, California
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storage tanks at Pearl Harbor for the Navy in 1940. At that time, the Navy was bolstering its defenses in the Pacific and the big above-ground oil tanks at Pearl looked too much like sitting ducks.

Contractors asked by the Navy to design new underground tanks came up with a plan for horizontal tunnels. When the Navy requested Growdon to pass judgment on the new designs, he suggested putting the oil in vertical tanks which could be protected by a dome. The Navy accepted Growdon's plan and later awarded him a Navy commendation.

Another overseas job was to plan to control China's Yellow River, known as "China's sorrow" because of its destructiveness. At the request of the Nationalist government, Growdon and two other American engineers examined the river and offered a solution. But Chiang's difficulties with the Communists prevented effecting the plan.

The big problem of the Yellow River is silt. Mean annual runoff of the river is 42.6 million acre feet with an average silt content of 1 million acre feet. To preserve the usefulness of a proposed storage reservoir, a desilting method was needed. Growdon and his associates recommended provision of a gorge type reservoir with large capacity outlets at the bottom of the dam. Then the velocity of the water into the gorge above the dam could be varied by varying elevation of the water surface (and hence the cross section of the channel) so the desired silt concentration could be discharged from the reservoir.

• **Background**—A native of Iowa, Growdon studied engineering at the university of Nebraska but didn't graduate. Some years ago, the university awarded him an honorary doctor's degree.

After college he worked for 17 years with Pacific Northwest companies. In World War I, Growdon served in the Army Corps of Engineers, receiving the distinguished Service Cross for his part in constructing a vital bridge under enemy fire.

After joining Alcoa, Growdon directed design and construction of most large hydroelectric dams built by Alcoa to furnish power for its plants.

In World War II, he served as a colonel in the Resources Division of the Army.

The Turkish government asked for his aid in 1948 in a study of flood problems of the Seyhan River. His recommendations for water control

(Continued on page 97)

CHEVROLET Advance-Design TRUCKS

Buy on these plain, hard FACTS!

CHEVROLET first in demand in value in sales

Fact No. 1

COSTS LESS TO BUY

Payload pound for payload pound, a Chevrolet truck *lists for less* than any other truck with the qualifications to handle your job. As the world's largest manufacturer of trucks, Chevrolet takes advantage of production economies to pass substantial savings on to you!

Fact No. 2

SAVES MONEY ON THE JOB

Chevrolet trucks save you money over the miles with great proved features that cut costs. Valve-in-Head economy, rugged Hypoid rear axles, extra-sturdy channel-type frames and Flexi-Mounted cabs, Ball-Gear Steering, Synchro-Mesh Transmission.

Fact No. 3

RIGHT TRUCK FOR EVERY LOAD

Your first interest in a truck is: "How well will it do the job?" That's where Chevrolet trucks have it, because they're factory-matched to the payload—tires, axles, frame, springs, engine, transmission, brakes. You get as much truck as your job calls for.

Fact No. 4

KEEPS ITS VALUE LONGER

Chevrolet trucks traditionally keep their value longer to bring higher used truck prices, year after year, at trade-in time. That means real, substantial dollar-and-cents savings when you wish to replace your present truck with a new one.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

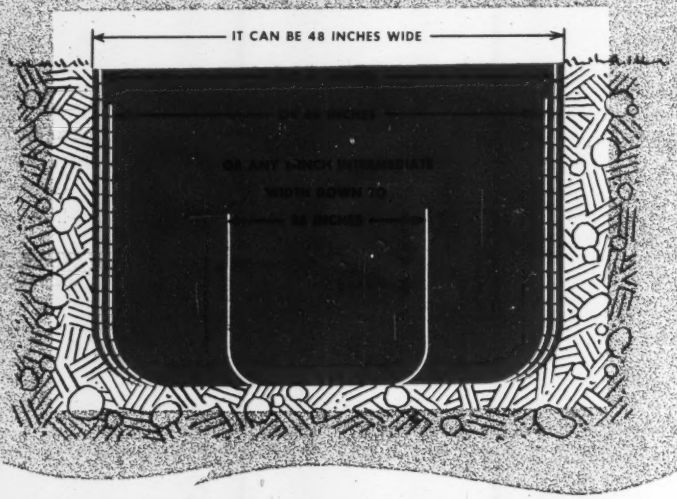
TWO GREAT VALVE-IN-HEAD ENGINES—Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURETOR—for smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH—for easy-action engagement • SYNCHRO-MESH TRANSMISSION—for fast, smooth shifting • HYPOID REAR AXLE—for dependability and long life • TORQUE-ACTION BRAKES—on light-duty models • PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES—on medium-duty models • TWIN-ACTION REAR BRAKES—on heavy-duty models • DUAL-SHOE PARKING BRAKE—for greater holding ability on heavy-duty models • CAB SEAT—with double-deck springs for complete riding comfort • VENTI-PANES—for improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STEERING—for easier handling • UNIT-DESIGNED BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN

TAILOR-MADE* DITCH

with

ESCO FASTBACK HOE DIPPER



and you dig 'em all with one machine

The trench dug by an *ESCO* FASTBACK hoe dipper is a genuine tailor-made job. It's the exact width you want. You dig and backfill only what your contract calls for. And you neither overload your machine nor get less than its full capacity.

For example, the ¾ yard FASTBACK is made in three basic widths. Simply by changing side cutters each basic unit gives you *seven* different widths. Thus one machine, while producing ¾ yard loads, can dig trenches anywhere from 28 to 48 inches wide.

ESCO catalog 189 explains construction in detail and gives details of sizes, dimensions and weights. Get your copy from your nearest *ESCO* representative, or send us the filled-in coupon.

*Example is for ¾ yard bucket. Other sizes from ¼ yard to 2½ yards have digging widths ranging from 20 to 63 inches.

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Please send me a copy of your Catalog 189 giving details of *ESCO* FASTBACK hoe dippers.

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Company_____

Address_____ Zone_____

City_____ State_____

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ESCO Dippers, Hoe Dippers, Dragline and Coal Loading Buckets

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construction are expected to increase the agricultural production of that river valley an estimated 300%.

Pittsburgh residents know him best for his work on the city's Smithfield Street Bridge. In the 1930's the then 48-year old bridge was to be condemned. But Growdon's suggestions to the city added at least 20 years to the bridge's useful life.

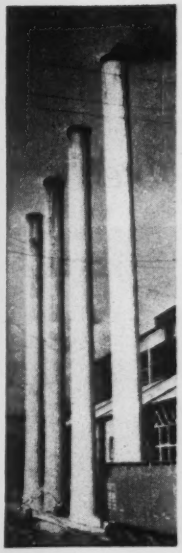
Careers . . .

• **Appointed**—**Homer M. Hadley,** Seattle consulting engineer, has announced formation of a partnership with his son, **Richard H. Hadley.** The new firm, Hadley and Hadley, will continue the structural practice of the senior Hadley in Seattle, Wash. . . . Newly named to the position of superintendent of the Virginia Military Institute in Lexington, Va., is civil engineer and General Electric Co. executive, **William H. Milton, Jr.** The Corps of Engineers has announced that **Col. Delbert B. Freeman** will be in charge of the Upper Mississippi Valley Division beginning July 1. At the same time the Corps said that his place as district engineer of the Fort Worth District would be taken by **Col. H. R. Hallock** . . . **E. W. Fickenscher** has joined the firm of Seelye, Stevenson, Value & Knecht, consulting engineers of New York City. He will be in charge of the Department of Bridges and Heavy Engineering Structures for the firm.

• **Honored**—General manager of the Lansing, Mich., Board of Water and Electric Light Commissioners, **Otto E. Eckert,** has been granted a life membership award in recognition of 35 years active membership in the ASCE. For a similar reason, **L. P. Scott,** district engineer for the U. S. Bureau of Public Roads, was granted a life membership . . . **Lillian M. Gilbreth,** time study expert, of "Cheaper by the Dozen" fame, was granted an honorary doctor's degree in engineering by Syracuse University . . . The honorary degree of doctor of science of Morningside College, Sioux City, Ia., was given to **Dwight W. Winkleman,** past president of the Associated General Contractors of America and general contractor.

• **Resigned**—**J. Paul Ambler** resigned from the position of District Engineer of the Pennsylvania Department of Highways' Pittsburgh District. His new position is assistant director in charge of engineering of the Allegheny Conference on Community Development.

CEMENT GUN CO.
REBUILDS STACKS
Without Service Interruption



By using "GUNITE", Cement Gun Co. crews were able to rebuild these stacks at a large Ohio steel plant while the furnaces were on heat. With these soaking-pit stacks in full operation, asbestos sheeting was wrapped around the steel shell and reinforcing attached. A coating of insulating mortar was shot on to line the stack and the structure was completed by shooting "GUNITE" in place. By using "GUNITE" our crews completely eliminated costly "down-time and the expense of dismantling the old stacks.

Many instances of repair, remodeling and new construction with "GUNITE" are described and pictured in Bulletin A2400. A request on your letterhead will bring your free copy by return mail.

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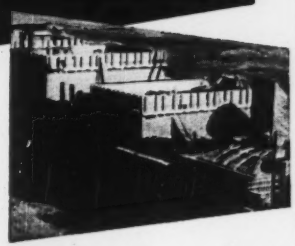
"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN PENNA U.S.A.
MANUFACTURERS OF THE CEMENT GUN

BONDS—
for Contractors
FAST, COUNTRY-WIDE SERVICE



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CLEAN - DRY - SAFE - DURABLE
OPEN GRID
GRATING - FLOORING
STAIR TREADS
FLOOR ARMOURING
BRIDGE DECKING

"A Fitting Grating for Every Purpose"

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SPECIAL PURPOSE DOORS

solve SPECIAL ENGINEERING PROBLEMS

When planning projects requiring specially engineered doors, you can usually save much time and structural expense by consulting Peelle before plans are too far advanced. The reason is readily seen when you consider the important part played by large, special purpose doors in the planning of structures for defense production or other modern industrial purposes. More often than not, it is advantageous to build the structure around such doors rather than to fit the doors into an already planned building.

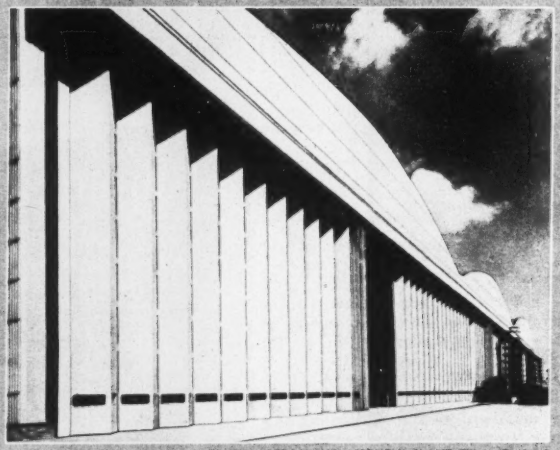
Peelle engineering service is based on long experience in specializing in the unusual . . . in designing and constructing doors requiring the use of unorthodox materials . . . in the imaginative application of sound engineering principles . . . and in the solution of many door problems that had to be answered for the first time.

Get the full benefit of Peelle engineering cooperation—write The Peelle Company in the early planning stage whenever your projects call for special purpose doors.

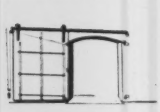
Peelle-Esavian Door - The front of this huge, three-bay hangar presents a continuous opening of 1045' in width and 65' 9" in height. To close this opening it was necessary to build one of the largest doors in the world, consisting of 3 pairs of sliding-folding aluminum-covered sections. Motive power is housed in the power mullions at each leading edge of the door structure.

The Peelle-Esavian Door is based on an entirely new principle which eliminates the necessity for expensive structural features in the building. The entire weight of the door is carried on the bottom track and the motivating power is on the door. This door offers many unique advantages, particularly for large openings of unusual height.

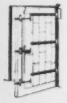
Write for new Peelle-Esavian Brochure.



BRISTOL AEROPLANE ASSEMBLY PLANT—Filton, England



RICHMOND UNDERWRITERS' FIRE DOORS



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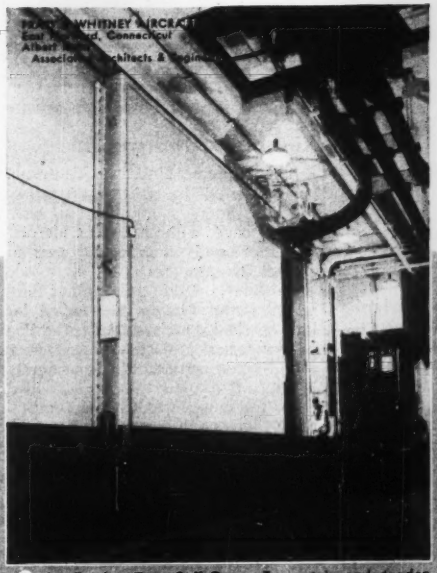
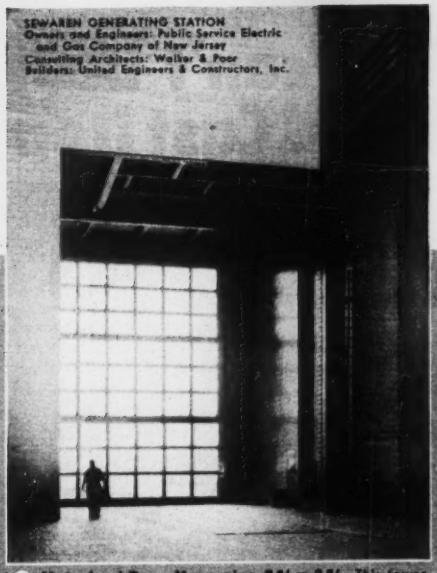
The Peelle Company and its wholly owned affiliate, The Richmond Fireproof Door Company of Richmond, Indiana, offer you wide variety of doors for industrial and commercial buildings, as well as Peelle Motorstairs. Illustrated here are some of the products of the Peelle-Richmond organization which are in wide use throughout the country. Specifications and details of any of these products will gladly be sent on request.

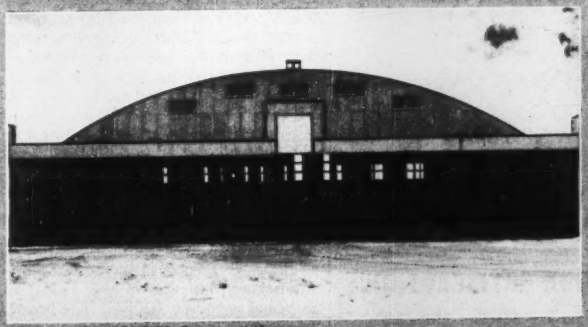


Jet Engine Test Cell Door - To contain and deaden the roar of jet engines on test, Pratt & Whitney Aircraft had The Peelle Company design and build ten of these huge concrete and steel doors for its new jet engine test cell block. Big enough to admit the most powerful engines of today and the even bigger ones to come, these doors had to be built as thick as the walls of the cells themselves to control the enormous volume of sound produced by the engine while running. Constructed in place, these dense concrete doors weigh 45 tons each, yet their electric motor drive travels them horizontally at the rate of 10 feet per minute quite easily. And, from outside the closed door, only a moderate hum can be heard of the earth-shaking roar of the jet engine running inside.


SEWAREN GENERATING STATION
Owners and Engineers: Public Service Electric and Gas Company of New Jersey
Consulting Architects: Walker & Poor
Builders: United Engineers & Constructors, Inc.

Motorized Door Measuring 24' x 35' - This towering stainless steel and glass door was engineered and built by The Peelle Company to carry out the architectural treatment of the building and to satisfy the engineering requirements. Three vertical sliding panels in the door are counter-weighted and are operated by a triple parallel gear head reducing unit with brake. Door panels move at varying speeds to arrive simultaneously at open position.

This is one of many types of motorized doors and partitions designed and built by The Peelle Company for factories, power stations, warehouses, terminals, hangars, mills, garages, hospitals and schools. Peelle Engineered Doors merit consideration in your plans.



OSCODA AIR FORCE BASE—Oscoda, Michigan
Contractors: A. J. Erkin Construction Company

Hangar Door - This motor-operated, 14-section, horizontal sliding hangar door was designed and built by The Peelle Company for an opening 160 feet wide by 25 feet high. It is made with 6" channel framing and 13 gauge steel sheeting. Two inch Celotex is used for insulation. The tall door is the overhead sliding type.

The Peelle Company builds hangar doors of all types and sizes for airports, aviation manufacturers and the U. S. Armed Forces.

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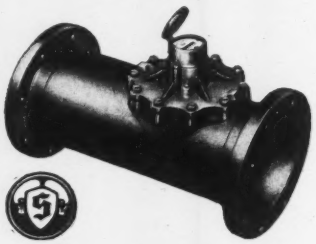

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LEGAL

Right to withdraw bid

The Supreme Court of California has reasserted the right of a contractor to withdraw a bid after bids have been opened, without loss of his performance bond, when he discovers an error in his estimates.

On July 28, 1948, the Board of Public Works of Los Angeles called for bids on the piping system for the Hyperion sewer project. Bidders were to submit a certified check or surety bond, and the city charter provided that "the bond or check and the proceeds thereof will become the property of the city of Los Angeles, if the bidder fails or refuses to execute the required contract. . . ." The charter provided further: "After bids have been opened and declared, except with the consent of the officer of the board of City Council having jurisdiction over the bidding, no bid shall be withdrawn, but the same shall be subject to acceptance by the city for a period of three months. . . ." The notice inviting the bids reserved to the board the right to reject any and all bids, and both it and the official bid form stated that "bidders will not be released on account of errors." Bids were to be opened Aug. 25, 1948.

One bidder did not learn of the call until a few days before the opening and his staff worked on the estimates up until 2:00 a.m. of the opening day. When the bids were opened it was found that his bid of $780,305 was low, the others being $1,049,592; $1,183,000 and $1,278,895.

Several hours after the opening the low bidder's staff found that an item of $301,769 had been omitted in consolidating their separate estimates. The low bidder immediately notified the board of his error. Subsequently, at the board's invitation, he submitted evidence to the board to show the unintentional omission of the $301,769 item and withdrew his bid. The board, however, passed a resolution accepting the erroneous bid of $780,305. The low bidder refused to enter into a written contract at that figure.

On Oct. 15, 1948, without readvertising, the board awarded the contract to the next lowest bidder. The city then demanded forfeiture of the low bidder's bond, whereupon the contractor brought an action to cancel his bid and to obtain a discharge of its bond. The city cross-claimed for the forfeiture of the bond and for damages.

The trial court granted judgment for the contractor, cancelling the bid

and discharging the bond, and allowed the city nothing on its counterclaim. This judgment was affirmed by the Supreme Court last year on appeal.[1]

(1) M. F. Kemper Const. Co. v. City of Los Angeles, 235 p. 2d 7. Supreme Court of California, August 28, 1951.

Liquidated damages for delayed performance

Where the parties have agreed that proof of an actual damage for delay in the performance of a contract is impracticable or difficult, courts look with favor upon reasonable agreements for liquidated damages made by the parties with full understanding of the situation confronting them and such contract provisions are uniformly enforced as the parties have written them.

Where, however, the amount stipulated in the contract as liquidated damages for the failure of performance bears no relation to the actual damage which may reasonably be anticipated from such a failure, courts decline to enforce the terms of the stipulation. Contracts falling in this category are regarded by the courts as contracts for unenforceable penalties.

Where the contract for liquidated damages is reasonable in character, it is valid and enforceable although the party complaining of a failure of performance neglects or is unable to prove actual damages by reason of a breach of the contract.

It is also well established that where one seeking to enforce a provision for liquidated damages for delayed performance of a contract is responsible for the failure of performance, or has contributed in part to it, the provision will not be enforced. Where both parties are in default, courts will not attempt to apportion the delay due to each party in the absence of a contract provision requiring such apportionment.[1]

Courts have also refused to enforce provisions for liquidated damages for delayed performance where the failure to perform within the time stipulated results from changes in the plans or specifications or the ordering of extra work without stipulating a new date for the completion of the work.[2]

In these two cases extra work was ordered after the stipulated date of completion which was set forth in the contract.

(1) United States v Kanter, 137 F. 2d 828 and numerous cases there cited.
(2) Snare & Triest v United States, 55 Ct Cl. 386; N.Y. Continental Jewell Filtration Co. v. United States, 55 Ct. Cl. 288; Haffner v Perloff, 174 La. 687, 141 So. 377.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

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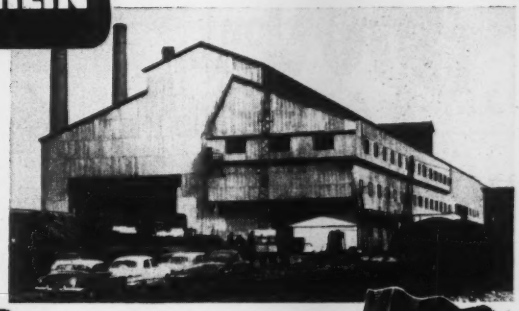

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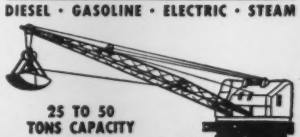

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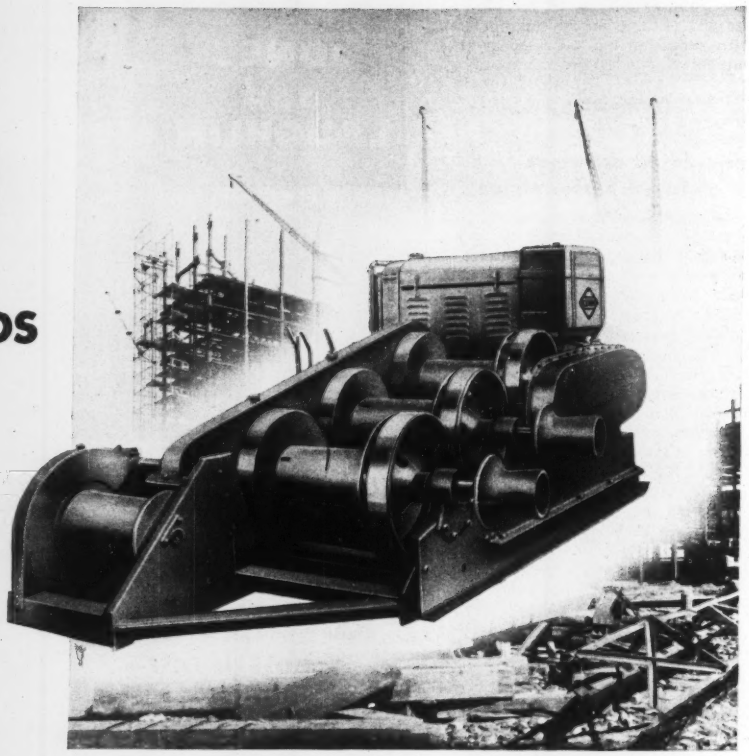

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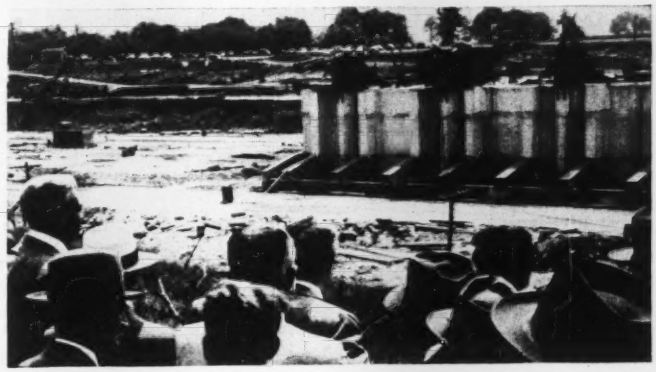


HOLLOW-BOX SUBSTRUCTURE for New York City's Pier 57 is under construction at Haverstraw, N. Y. Emil H. Praeger (extreme left) consulting engineer, described the design during a CIB field trip to the site.

CIB visits Pier 57 project

Finishing touches are being applied to one of the three buoyant concrete boxes that will form the substructure of Pier 57 on the Hudson River in New York City. Members of the Concrete Industry Board, as part of the technical session of the June 4 meeting, inspected the Haverstraw, N. Y., site, where the boxes are being built and saw them being made ready to be floated down the Hudson, probably during the first week of July.

The Concrete Industry Board was organized last year to improve quality of reinforced concrete construction in metropolitan New York.

Pier 57 will be a concrete and steel structure supported partly by the buoyancy of the hollow-box concrete substructure and partly by timber piles (ENR Jan. 11, 1951, p 46). Designed by Madigan-Hyland, consulting engineers, for the N. Y. Department of Marine and Aviation, it is being constructed by Corbetta Construction Co. and Merritt-Chapman & Scott Corp. under a $5,685,491 contract.

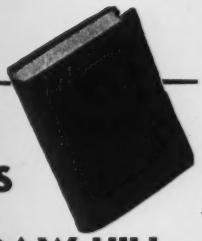
At the Haverstraw site, 38 miles north of New York City, the Concrete Industry Board saw under construction three 26,000-ton boxes about 350x80 ft by 32 ft deep. They also observed a production-line setup by the Freyssinet Co. for making precast prestressed joists. These will span between the reinforced concrete girders resting on top of the boxes and will support the main deck.

Before the field trip, the CIB re-elected Roger H. Corbetta, chairman; John F. Hall, district engineer, Portland Cement Association, secretary; and Dugald J. Cameron, Fireproof Products Co., treasurer.

Money and manpower worry highway group

Means of financing expanded highway programs and prospects of continuing shortages of trained engineer personnel were major subjects of discussion at the 31st annual conference of the Western Association of State Highway Officials meeting last week in Seattle, Washington. Membership of the group includes highway administrators of the 11 far western states, Texas, the territories of Alaska and Hawaii and corresponding officials of the bureau of public roads.

Financing was first discussed by W. A. Bugge, director of highways of the Washington State Highway Commission, in his address as association president. In relating the difficulty of keeping up with increased needs, Bugge said, " . . . we are in a crisis and . . . in many instances, the traditional pay-as-you-go method simply does not provide the funds . . . to overcome deficiencies . . . within a reasonable period of time." Bugge outlined methods of credit financing and seemed to favor bonds backed up by highway taxes. Washington has in fact adopted this means of catching up with deficiencies on



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2. A wealth of design data on prestressed concrete—with pointers on when and where to use it. Discusses steel and concrete, their types, and their behavior when combined into prestressed members. Book shows every step in prestressed concrete design—the problem itself, reckoning of dead and live load, the working of all equations. Many detailed examples show how prestressed concrete was used in actual structures. **By August E. Komendant, Consulting Engineer. 261 pages, 133 illus., $6.00**

PILE FOUNDATIONS

3. Provides information required for design, driving and maintenance of pile foundations. Covers relations between borings, soil mechanics, and pile foundations; the most effective methods for determining pile capacities from driving resistances and friction values; selection of rigs; factors affecting choice of pile type, etc. One chapter supplies over 50 actual cases of pile foundation failures, with causes, methods of prevention, and remedies. **By Robert D. Chellis, Structural Eng'r., Stone & Webster Corp., 640 pages, illus., $12.50**

ENGINEERING IN PUBLIC HEALTH

4. Explains the engineer's problems and methods in providing public health protection. The organization and administration of Federal, state, and local health departments—methods of combating diseases—use of disinfectants, insecticides, etc.—are covered. Gives information on equipment and practices for prevention of air pollution, sewage treatment, industrial waste disposal, rural sanitation, etc. **By Harold E. Babbitt, Prof. of Sanitary Engin., Univ. of Ill. 582 pages, 53 illus., 70 tables, $8.00**

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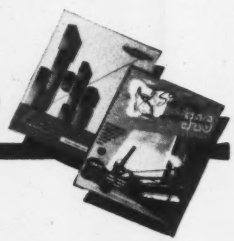


MAINTENANCE INC.
WOOSTER, OHIO

MEETINGS

U. S. 99—its most important north-south route.

Toll roads also were considered by the group. Mark U. Watrous, Colorado state highway engineer, covered this as Colorado is the only member state having a toll road—the Denver-Boulder Turnpike. In spite of the successful but brief experience record of the Colorado toll-road, Watrous cautioned that application of such financing was limited.

• **Engineer shortage**—Present and future shortages of engineers was first brought up at the Seattle meeting of Wash by association president Bugge in his presidential address. Quoted figures giving the annual need for highway engineers as 30,000 per year for 10 years. This compares with 12,000 who will actually become available in June, 1952, 24,000 in 1953 and 17,000 in 1954.

This theme was carried further by Raymond Archibald, chief of the Bureau of Public Road's western headquarters. Archibald suggested that to spread the work of present engineers many further expedients will have to be adopted. More expensive procedures like aerial photography and radio communication should be thoroughly considered, he said. Time savers should be used like reduced inspection—where possible, bidding bridge steel on a lump sum rather than a per pound basis and use of improved machine computation procedures rather than planimeter methods for computing cut and fill.

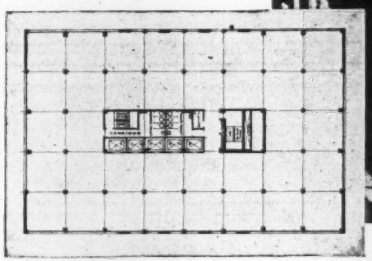
R. M. Gillis, California deputy state highway engineer, in discussing controlled access highways gave interesting accident rate figures. In California for 1950 the accident rate for 4-lane undivided highways was 3.67 per million vehicle miles. This compares with 3.17 for 4-lane divided highways, 2.13 for 4-lane express highways (controlled access but including unseparated intersections) and 1.51 for full freeways.

The group split the new Dr. L. I. Hewes award between Herbert Humphries of Washington and J. T. McWilliams of California. Humphries made soil tests more usable in city-county work and McWilliam developed gyroscopic survey methods for rapid road inventory.

New officers include: president, Mark U. Watrous, Colorado State Highway Engineer; Vice President, Earle V. Miller, Idaho State Highway Engineer; and secretary-treasurer, William E. Willey, Arizona Highway Department.

("Meetings" *continued on page 106*)

Below: Typical floor layout, showing reinforced concrete central core and exterior panels which effectively resist the horizontal loads developed by earthquake forces.



Architect: Claude Beelman; *Associate Architect:* Herman Spackler; *General Contractor:* C. L. Peck; *Structural Engineers:* Brandow and Johnston.

LOS ANGELES OFFICE BUILDING

Has Simple, Light Steel Frame

This 12-story, 3-unit office building in Los Angeles, built recently for the Tishman Realty and Construction Co., Inc., of New York, is a limit-height structure with a structural frame, including intermediate beams, weighing only 11 lb psf of floor area.

The light-weight construction of this building was made possible by changes in the Los Angeles Building Code, permitting the use of prefabricated light-gage steel floor panels, acting as transverse diaphragms to transmit lateral or earthquake forces. The structural frame is designed to resist vertical loading only.

Another weight-saving factor of this new building is the use of a false ceiling of vermiculite plaster, suspended 14 in. below the bottom of the floor beams. This fireproof envelope replaces the heavy encasement of each beam, which was required under earlier Codes. It reduces the dead load, cuts material costs, and saves erection time.

Each of the three 100 ft x 150 ft units has a 20 ft x 75 ft central core, providing elevator and air-conditioning services. The cores and some exterior panels have reinforced concrete walls 12 in. thick. Resistance to shear, designed into these walls, combats earthquake forces. The structural design gives complete freedom in placement of partitions. Under-floor ducts facilitate the installation of utilities.

Both the fabrication and erection of the 3500-ton steel framework for this unusual, glass-fronted structure were handled by Bethlehem Pacific Coast Steel Corporation, Bethlehem's subsidiary on the Pacific Coast.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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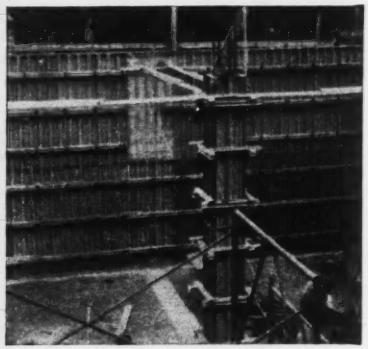
Ask a representative to call.



You Don't Buy New Forms for Every Poured Concrete Job

Atlas Speed Forms are interchangeable for use on slabs, walls, circular tanks, manholes, modular structures. For Rent or Sale.

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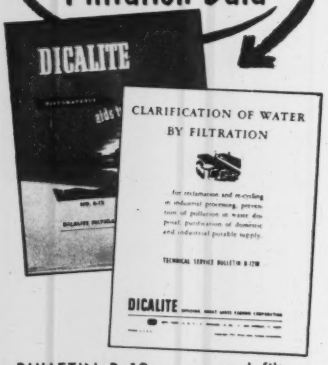
LABOR-SAVING *SPEED* FORMS

Send For This New Water Filtration Data



BULLETIN B-12 on general filtration principles; BULLETIN B-12-W details information on filtering potable and waste water.

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GREAT LAKES CARBON CORPORATION
612 S. Flower St., Los Angeles 17, Calif.

For **STRENGTH** specify

TRI-LOK
RECTANGULAR
OPEN STEEL FLOORING

The locked-in strength of Tri-Lok enables it to stand up under heavy loads—even on long spans. Get maximum strength, air and light with minimum weight.

Tri-Lok is also available in Diagonal, or Super-Safety U-type Flooring, and in Stair Treads of all types. Write for Bulletin KK 1140.

The Tri-Lok Company is also equipped to furnish *riveted* and Tri-Forge *welded* open steel flooring. Tri-Lok can be furnished in a variety of metals, including aluminum alloy, stainless steel, etc.

DRAVO CORPORATION
National Distributor for the Tri-Lok Company
Dravo Bldg., Pittsburgh 22, Pa.
Sales Representatives in Principal Cities

DRAVO

MEETINGS

Expanded shale makers form institute

At a recent meeting in St. Louis, Mo., representatives of the expanded shale industry organized the Expanded Shale Institute on a national basis.

S. Carl Smithwick, formerly a district engineer of the Portland Cement Association and now head of the Smithwick Concrete Products of Portland Ore., was elected president of the institute. Other officers are: W. W. Allen, S. Louis, Mo., first vice-president; A. R. McVoy, Dallas, Tex., second vice-president; A. R. Waters, Kansas City, Mo., secretary; J. Murray Black, Buffalo, N. Y., treas. The institute's program as adopted at the St. Louis conference includes the establishment of minimum standards of quality production; the correlation of research and experimental work already performed by other agencies as well as original research; educational and promotional work with the entire construction industry.

CALENDAR

American Society for Engineering Education, Dartmouth College, Hanover, N. H., June 22-27.

National Businessmen's Conference on Urban Problems, Portland, Ore., June 23-24.

Forest Products Research Society, annual meeting, Milwaukee, Wis., June 23-25.

American Society for Testing Materials, 50th anniversary meeting, Hotel Statler, N. Y. City, June 23-27.

American Institute of Architects, Waldorf-Astoria Hotel, N. Y. City, June 23-27.

Symposium on Earthquake and Blast Effects on Structures, University of California, Los Angeles, Calif., June 26-28.

National Conference on Clays and Clay Technology, University of California, Berkeley, July 21-25.

National Surveying Teachers' Conference, Camp Blackduck, Minn., Aug. 3-8.

Mississippi River Parkway Planning Commission, La Crosse, Wis., Aug. 21-23.

American Public Works Association, Ambassador Hotel, and Shrine Auditorium, Los Angeles, Calif., Aug. 24-27.

Pan American Union of Engineering Societies, 3d Congress, Tulane University, New Orleans, La., Aug. 25-30.

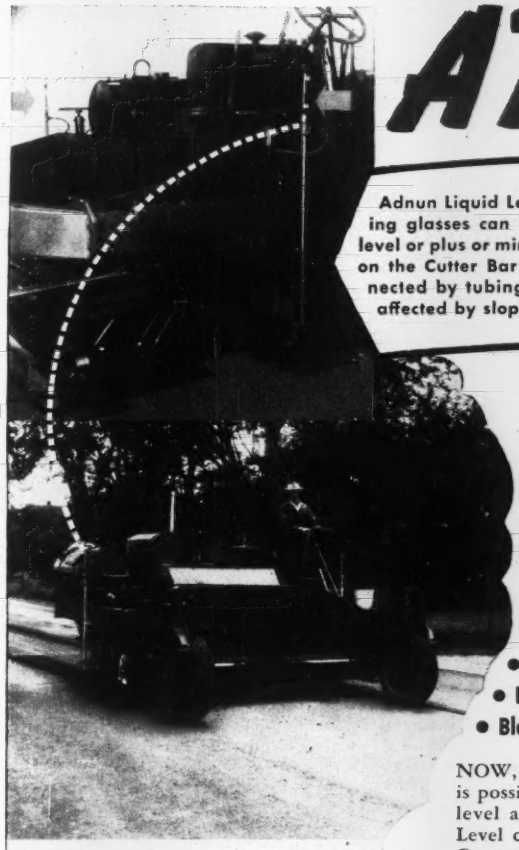
National Council of State Boards of Engineering Examiners, The Antlers Hotel, Colorado Springs, Colo., Sept. 4-6.

N. Y. State County Superintendent's Association, Concord Hotel, Kiamesha Lake, Monticello, N. Y., Sept. 9-11.

International Symposium on the Chemistry of Cement, London, England, Sept. 15-20.

Sept. 4—ENR's Annual Cost Issue

AT LAST..



Adnun Liquid Level: Vertical reading glasses can be set for absolute level or plus or minus. Being mounted on the Cutter Bar Supports and connected by tubing, liquid is directly affected by slope of Cutter Bar.

Reading Glass Detail

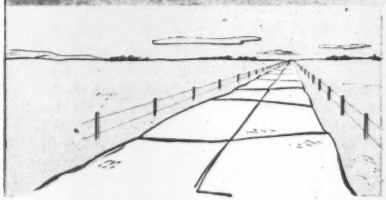
Positive Leveling Control for Black Top Paving!

- Level up old road perfectly and positively
- Correct accurately for any slope at any station
- Holds level grade without modifying desired crown
- Blend new *level* shoulder into old crown

NOW, for the first time in the history of black top paving, it is possible to lay a level surface over old road and *hold it* level accurately and positively. The new Adnun Liquid Level combined with the direct lift feature of the Adnun Cutter Bar Screed has made this a certainty. The Adnun Liquid Level permits following fluctuations in grade, visually. Mechanical adjustment on the direct lift Cutter Bar Screed permits instantaneous or gradual corrections to hold the bubble in the level at the desired setting for an absolutely level surface.

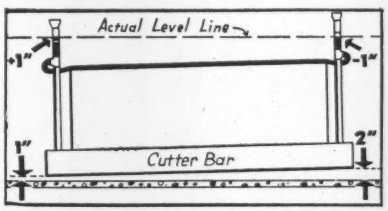
You can bring wavy old roads with reverse slopes to "level". You can build dipping shoulders up to level and blend them into old crown. You can correct, accurately, for any slope at any station.

Only a Black Top Paver with a screed having a straight lift can do this. Adnuns make new roads out of old. They do things other pavers won't do. Remember, the important result is a good road. Ask for details.



Above: Roads of this type are becoming an increasing problem to Highway Departments. They can be leveled with Adnuns.

Below: Diagram of Liquid Level set to lay course 1" at shoulder and 2" at crown. This could be reversed to build up undulating or broken down shoulder.



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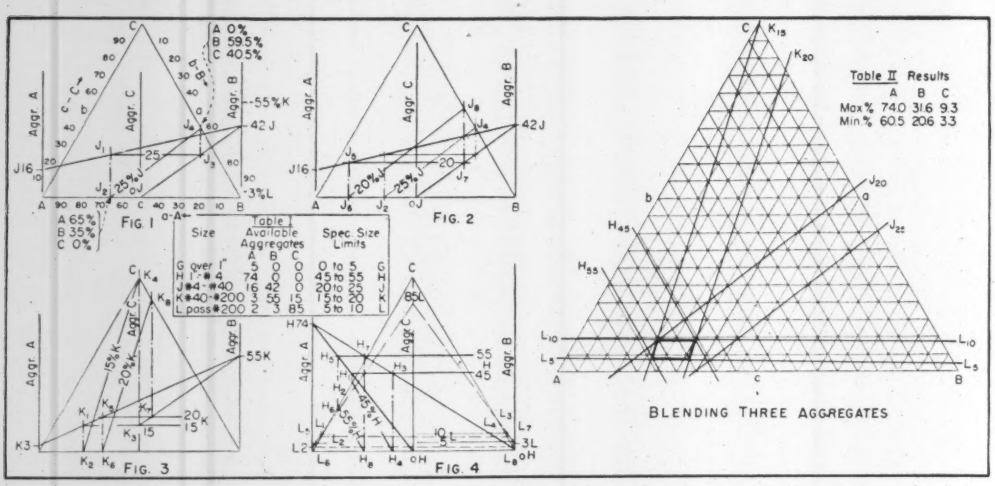


Simplified graphical method works blending aggregates

George F. Driscoll
Associate Professor
Department of Civil Engineering
University of Notre Dame

Anyone blending three differently sized aggregates to make a specified mixture will find this method simple and practical.

It is an outgrowth of a more involved graphical solution of the aggregate blending problem presented in ENR Jan. 5, 1950, p. 45. That presentation aroused much interest and stimulated discussion among Vernon Paulson, of Omaha, Neb., R. R. Dobelbower, of Pleasant Gap, Pa., and the author. This new method, developed out of the discussion, requires no computation whatsoever, nor any measurement of lines.

• **Why triangular coordinates?**—Triangular coordinate paper is used, since the sum of the distances of any point within an equilateral triangle from the three sides is constant and equals the length of one side—in this case, 100%.

Selecting any point within the triangle (above) the proportion of Aggregate A is the distance from the base BC (measured along the line aA); the proportion of Aggregate B is the distance from the base AC (measured along bB); and Aggregate C is similarly measured along cC. It is helpful to remember that the point labeled A represents 100% Aggregate A, B represents 100% Aggregate B, and C represents 100% Aggregate C.

Table I gives the sizing of the three aggregates, A, B, and C which are to be combined in a blend to meet the specification limits shown. In Fig. 1, three vertical lines are erected for each aggregate upon which are represented the grading of the particular aggregate. The vertical line representing Aggregate B is completely marked showing it is composed of 42% of #4-#40, 55% of #40-#200, and 3% passing #200.

Using the #4-#40 fraction (designated as J) as an example, the percentages of Aggregates A, B and C which can be combined to yield exactly 25% of the #4-#40 fraction will be determined. This will be done by making a satisfactory blend of Aggregates A and B, another satisfactory blend of Aggregates B and C, and then combining the two blends to obtain a mixture with a constant 25% #4-#40 fraction although the percentages of Aggregates A, B and C may vary.

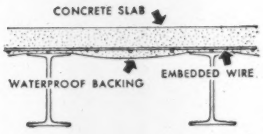
• **Mechanics of solution**—On Aggr. A line locate J at 16%, on Aggr. B line locate J at 42%, and on Aggr. C line locate J at 0%. Draw lines J16 J42 and J0 J42. Draw the horizontal 25% line to obtain J_1 which is projected to J_2, which represents a blend of 65% A and 35% B (0% C). Extend the horizontal 25% line to its intersection with the line J0 J42 at J_3. J_3 is projected to the CA line of J_1 which represents a blend of 59.5% B and 40.5% C (0% A). The proportions of Aggregates A, B and C represented by points J_2, J_4, or any points on the line J_1J_4 will make a composite in which the #4-#40 fraction will equal 25%.

Refer to Fig. 2 where the very same procedure is followed to establish the 20% proportion limit line J_5J_7. The proportions of Aggregates A, B and C represented by any point in the area between the two lines J_5J_1 and J_6J_7 will yield a percentage of #4-#40 which will be between the specification limits of 20% and 25%.

Fig. 3 illustrates the solution of the K fraction and Fig. 4 represents the solution of the H and L fractions. Fraction G is not represented.

As the various limit lines of each fraction are determined, they are transferred to the graph. Area enclosed by the heavy lines, common to all limits, represents all possible proportions of the three aggregates A, B and C which can be used to obtain a blend within specification limits. Thus, Aggregate A can vary from 60.5% to 74%, Aggregate B, from 20.6% to 31.6% and Aggregate C can vary from 3.3% to 9.3%. If the common area does not lie between each pair of limit lines, it is impossible to meet all specifications with the three aggregates available.

mammoth decks of this huge new air terminal poured over **Steeltex Floor Lath**



Note, *in the cross section and closeup that the weight of the wet concrete forces the backing away, which permits the galvanized welded wire mesh to assume its proper position in the slab. Steeltex Floor Lath also performs two other functions. It permits work on the floor below while pouring is in progress and retains moisture to assist proper curing.*

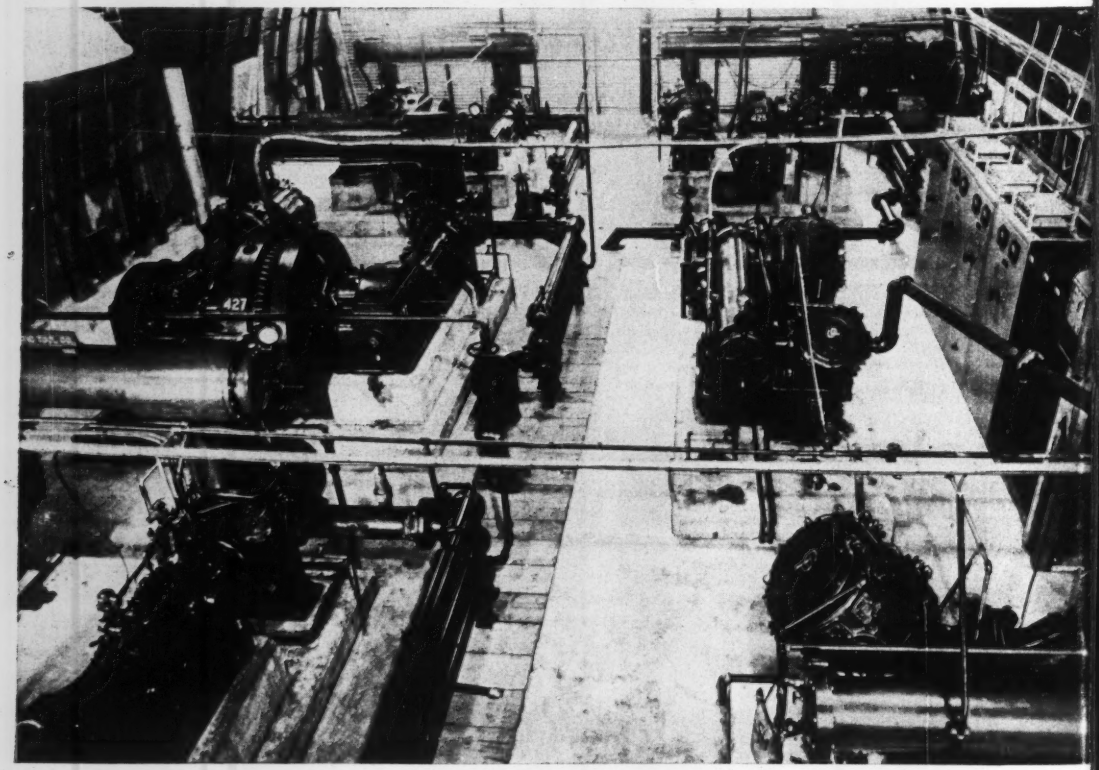
Greater Pittsburgh Airport, destined to become an inland hub of international air traffic, is greater in size than LaGuardia and National Airports combined. The terminal, aptly described as a city within a city, is so extensive that it is able to contain a hotel, theatre, bank, public garage, nightclub, shops and restaurants in addition to its normal facilities.

It was no mere coincidence that the broad concrete decks necessary to carry this load should be poured over Steeltex Floor Lath. Steeltex offers speed and economy because it may be rapidly installed and work may continue on the floor below while pouring is in progress. It insures high quality and safety because the galvanized welded wire mesh is properly embedded and the slab is properly cured because the tough waterproofed backing retains the water, thus insuring the correct water-cement ratio. For detailed information about Steeltex Floor Lath, the combined form and reinforcing, see our catalog in Sweet's or write for catalog D.S. 133, Dept. ENR, Pittsburgh Steel Products Co., Grant Bldg., Pittsburgh 30, Pa.

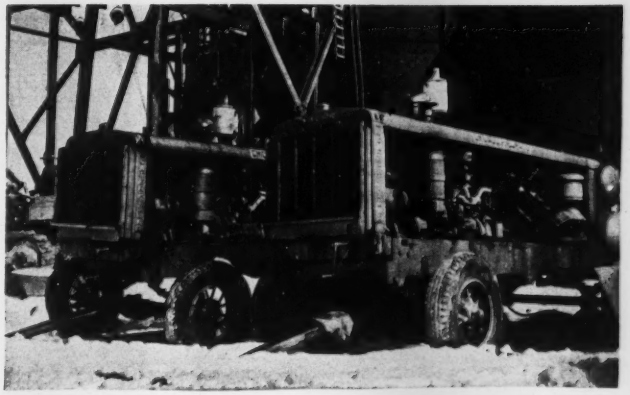
Pittsburgh Steel Products Co.
A Subsidiary of Pittsburgh Steel Company

CP VIBRATORS on a heavy mass placement job that involved the vibrating of nearly three million cubic yards of concrete.

This installation of six CP AIR COMPRESSORS—four Type O-CE and two Type Y—provides 7000 cfm. of air at 100 lbs. for one of the largest hydroelectric and irrigation construction projects in America.



Two 600 cfm. CP PORTABLE COMPRESSORS on big construction job. Gasoline and Diesel driven models are available from 60 cfm. to 600 cfm.



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With its tubular chassis and drill carriage, centralized controls, and other special features, the G-300 WAGON DRILL can utilize to full advantage the high drilling speed and strong rotation of the CP 4-inch 70-N Drifter.

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USF PORTABLE STEEL UTILITY Buildings

NOW! USF all-steel Utility Buildings are available in 12 ft. as well as 10 ft. head clearance models. Formed steel columns and trusses, and box corrugated roofing and siding sheets that attach with clip and wedge fasteners, make erection fast and inexpensive—100% salvageable in case of dismantling. Fully prefabricated—no fitting—no riveting—no welding!

Choose from six types of wall panel for full versatility of purpose . . . add multiple widths as needed . . . or, add to length in standard multiples.

WRITE for new descriptive bulletin which includes self-planning chart.

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OBITUARIES

Harold H. Marsh, 80, retired chief structural engineer for the Washington, D. C., municipal architect's office, died June 1 in Kensington, Md. A past president of the Washington, D. C. section of the American Society of Civil Engineers and a charter member of the Engineers Club of Washington, Mr. Marsh was a London University graduate. He designed many railroads, bridges and buildings in England, Scotland and India before coming to this country in 1907. He worked for 12 years in the old Treasury architect's office, now the Public Building Service, before joining the district government. He was an authority on soil and terrain of the Washington area.

Commander Vernon P. Robnett, USNR, 46, Washington, D. C., civil engineer, died May 26 in Athens, Greece, where he was with an American engineering firm. He attended the U. S. Naval Academy for two years and was graduated in 1927 from Princeton University. He worked for several engineering firms and was sent all over the United States, Mexico and Cuba. In 1940 he returned to Washington, D. C., as an engineer for Reconstruction Finance Corp. He was called to active duty in October, 1941, and taught engineering at the Naval Academy for three years. Later he was commandant at a naval base in Iceland. He returned to civilian life as an engineer with the Navy Bureau of Ordnance and worked on installations throughout the Pacific, the United States and the Caribbean.

William A. Whitmire, 71, retired civil engineer, died May 26 in Redding, Calif. He was superintendent in charge of the construction of the Donner Summit Southern Pacific Railroad tunnel. He also supervised the construction of the California highway low level Broadway Tunnel in Oakland.

Thomas J. Daly, 62, Camden, N. J., city engineer since 1923, died June 1 in Stone Harbor, N. J. Employed in the city engineer's office since his graduation from the University of Pennsylvania in 1913, he had supervised Camden's current multi-million dollar improvement program.

Arthur J. Forth, 63, village engineer of Solvay, N. Y., for 25 years, died June 5. He was employed as an engineer at the Solvay Process Corp. until his recent retirement.

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They're all needed to keep steel production up

...TO AID DEFENSE

Every pound of unused iron and steel you have is needed to help steel mills and foundries keep production up to rising capacity.

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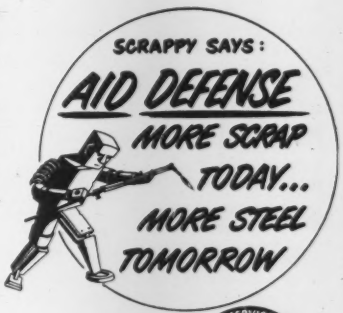
One way we can maintain desired level of both military and civilian production is for you to *dig up* and *turn in* your iron and steel scrap now.

Get in touch with your local scrap dealer and write for the free booklet, "Top Management: Your Program for Emergency Scrap Recovery" to Advertising Council, 25 W. 45th St., New York 19, N. Y.



NON-FERROUS SCRAP IS NEEDED, TOO!

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Hill of volcanic ash 250 ft. high is moved by 3 cu. yd. Sauerman Scraper which loads the material into cars using a simple ramp.

Big Excavations Handled in One Operation by a

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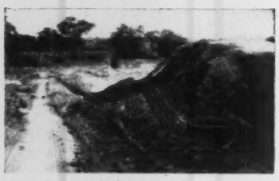
Old pile of mine waste covering 12 acres is reclaimed and delivered to crusher by small Sauerman Scraper.



Here is a small Sauerman Scraper cutting down a bank of clay which it hauls 300 ft. to brick plant.

Many difficult dig-and-haul jobs, such as the three illustrated here, are reduced to simple terms by use of a Sauerman Drag Scraper machine.

An exclusive feature of the Sauerman Machine is the unique Crescent bottomless scraper bucket. Because of its streamline design, the "Crescent" penetrates hard materials with the ease of a plowshare, gathers a full load in a few seconds, then rides its load to the dumping point where it makes an instantaneous, clean dump. Thirty to forty or more heaping loads moved per hour, the exact number of round trips of the scraper bucket depending upon the length of the operating span.

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Reports and Pamphlets

BUILDING RESEARCH IN CANADA—Volume 1, No. 2. The Division of Building Research, National Research Council, Ottawa, Ont., Canada.

PRINCIPLES UNDERLYING THE INTERPRETATION OF SEISMOGRAMS—Special Publication 254, Coast and Geodetic Survey. Superintendent of Documents, Washington 25, D. C. $1.00.

A SURVEY OF PROGRESS 1944-1951—Bulletin No. 1, Column Research Council of Engineering Foundation. Obtainable from L. S. Beedle, Fritz Engineering Laboratory, Lehigh University, Bethlehem, Pa.

FINANCING CAPITAL IMPROVEMENTS IN MARYLAND—Publication No. 71, Maryland State Planning Commission, 100 Equitable Bldg., Baltimore 2, Md. 50¢.

SLOPE DISCHARGE FORMULAE FOR ALLUVIAL STREAMS AND RIVERS—New Zealand Institution Of Engineers, Wellington, New Zealand.

DETERIORATION OF STRUCTURES OF TIMBER, METAL, AND CONCRETE EXPOSED TO THE ACTION OF SEA-WATER—Nineteenth Report of the Committee of the Institution of Civil Engineers, London. Price 5s.

LIME STABILIZATION OF CLAY SOIL—Bulletin No. 124. Texas Engineering Experiment Station, College Station, Texas.

TENTATIVE STANDARD SPECIFICATIONS FOR REINFORCED CONCRETE WATER PIPE—NONCYLINDER TYPE, NOT PRESTRESSED—American Water Works Association Inc., 521 Fifth Avenue, New York 17, N. Y. Price: 20¢.

ASTM STANDARDS ON BITUMINOUS MATERIALS FOR HIGHWAY CONSTRUCTION, WATERPROOFING, AND ROOFING — American Society for Testing Materials. 1916 Race St., Philadelphia 3, Pa. $3.25.

RIVETING ALCOA ALUMINUM—Aluminum Company of America, Gulf Building, Pittsburgh, Pa.

HIGHWAY RESEARCH BOARD—Bulletin 39, Precasting Highway Bridges and Structures (45¢); Bulletin 40, Load Carrying Capacity of Roads as Affected by Frost Action (75¢); Bulletin 41, Traffic Surveys by Post Cards (60¢); Bulletin 42, Soil Compaction (45¢); Bulletin 43, Studies in Night Visibility (90¢); Bulletin 44, Volcanic Ash and Laterite Soils in Highway Construction (60¢); Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

(Continued on page 116)

Make your city look better with these strong, steel poles

● National Tubular Steel Poles can improve the appearance of your city in a hurry. These steel poles are slim and graceful because steel is so very strong. You can have greater height with a small pole diameter, therefore you have less visual obstruction—less safety hazard.

Steel poles are economical. When used to carry overhead lines, they can be spaced farther apart, so you don't have to use so many poles. Steel poles are easy to erect and, except for an occasional paint job, they require no maintenance.

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For more information, write National Tube Division, United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

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NATIONAL TUBE DIVISION, UNITED STATES STEEL COMPANY, PITTSBURGH, PA.

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Does More Work Faster . . .

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Work faster wherever you need compact, lighter-weight sawing power. Model 11E18 Electric Chain Saw *weighs only 19 lbs.* . . . one hand guides it easily. Handles lumber and trees up to 18" thick in one cut, up to 36" in two cuts . . . hard, soft, wet or frozen wood. AC-DC 115-volt, 11 amp.; 230 volt, 5.5 amp. motor.

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(*Continued from p. 114*)

HIGHWAY RESEARCH BOARD—Bibliography No. 10—Landslides (90¢); Bibliography No. 11 Origin-Destination Surveys and Traffic Volume Studies ($3.00); Bibliography No. 12; Joint, Crack, and Undersealing Materials (45¢); Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

THE CANADIAN SNOW SURVEY 1947-1950. Technical Memorandum No. 21. National Research Council of Canada, Ottawa, Ontario, Canada.

SELF-SIPHONAGE OF FIXTURE TRAPS — Building Materials and Structures Report 126. Superintendent of Documents, Washington 25, D. C. 20¢

FIELD PENETRATION TESTS FOR SELECTION OF SHEEPSFOOT ROLLERS—Technical Memorandum No. 3-333. Waterways Experiment Station, Vicksburg, Miss. $1.00.

INVESTIGATION OF THE SUITABILITY OF PREPAKT CONCRETE FOR MASS AND REINFORCED CONCRETE STRUCTURES — Technical Memorandum No. 6-330. Waterways Experiment Station, Vicksburg, Miss. $1.00.

DESIGN STUDIES FOR A CLOSED-JET WATER TUNNEL—Technical Paper No. 9, Series B. St. Anthoney Falls Hydraulic Laboratory, Minneapolis, Minn. $2.00.

BRINE CONTAMINATION IN THE MUSKINGUM RIVER—Ohio River Valley Water Sanitation Commission, 414 Walnut St., Cincinnati 2, Ohio.

PROCEEDINGS OF THE Third California Conference on Street and Highway Problems (January 24-26, 1951)—The Institute of Transportation and Traffic Engineering University of California, Berkeley, Calif. $1.00.

PROGRAM FOR LAND AND WATER RESOURCES DEVELOPMENT OF THE MISSOURI RIVER BASIN—Missouri Basin Inter-Agency Committee, 610 South Canal Street, Chicago 7, Ill.

PREDICTING THE RUNOFF FROM STORM RAINFALL—Research Paper No. 34. Weather Bureau, Superintendent of Documents, Washington 25, D. C. Price 5¢.

LIST MOTION PICTURE FILMS OF THE CORPS OF ENGINEERS, U. S. Army, Available for public exhibition and television. Corps of Engineers, Department of the Army, Washington 25, D. C.

JOINT MATERIALS FOR VITRIFIED CLAY PIPES—Sanitary Engineering Series No. 3. Department of Civil Engineering, University of Illinois, Urbana, Ill.

ARC WELDING—Charles H. Zielke. The Bruce Publishing Company, Milwaukee, 1, Wis. 80¢.

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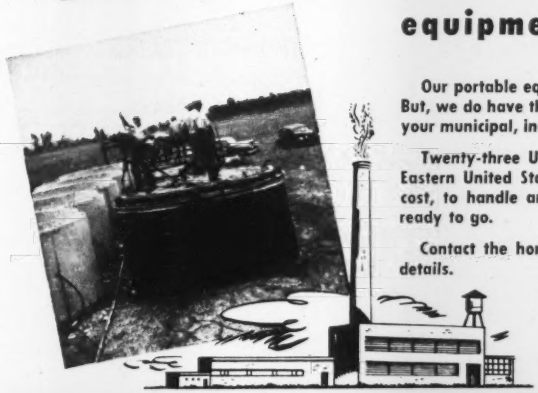

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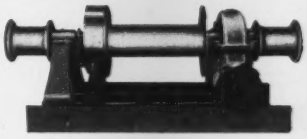

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SAN FRANCISCO: 68 Post St. (4)

CIVIL SERVICE

CIVIL ENGINEERING Draftsman—Examination No. 6748. 68 vacancies. Applications not issued through the mails. Written test held on September 24, 1952. Applications and particulars issued and received from June 3, 1952, until further notice by Municipal Civil Service Commission, 96 Duane Street, New York 7, N. Y.

POSITIONS VACANT

CIVIL ENGINEER graduate, under 40, paving experience desirable, for technical, promotional, educational work in Pennsylvania. Permanent. Please give summary of education, experience, salary requirements in reply. P-4501, Engineering News-Record.

ENGINEER—ESTIMATOR. Experienced for Westchester County (N.Y.) contractor doing highways, sewers, paving, excavation & other public works. Present staff knows of this advertisement. Please submit qualifications, experience, salary, etc., for appointment. P-4518, Engineering News-Record.

GENERAL SUPERINTENDENT — Marine and Heavy Construction. Permanent position. Location Southern New England. P-3974, Engineering News-Record.

SEVERAL ENGINEERS in office of consultant on sanitary projects, experienced in this or related fields such as structural or hydraulic. Permanent positions intended. Full information, references and salary requirement requested. Location, Ohio. P-4497, Engineering News-Record.

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ROAD SUPERINTENDENTS, foremen and highway bridge superintendents. Write complete background with references and salary expected. Location upstate New York. P-4489, Engineering News-Record.

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(Continued on opposite page)

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P-4560, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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P-4565, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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Superintendent-Engineer and 3 Foremen

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RW-4564, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

(Continued from opposite page)

HOME OFFICE Manager Wanted, familiar with Railroad Track work, Water Lines, Drainage, Grading, General Accounting, and Buying. Location—Detroit, Michigan. P-4499, Engineering News-Record.

WANTED: YOUNG construction engineer with 5 years experience in industrial and commercial construction. Permanent position for the right man. Write full details on qualifications and experience. Reply to Lewis C. Bowers & Sons, Inc., Princeton, New Jersey.

YOUNG MAN interested in trade association work to assist managing director. Must have experience in mimeograph, postage meter, stencil cutting and general office work. Location Albany, N. Y. Write giving background and salary expected. P-4490, Engineering News-Record.

POSITIONS WANTED

CIVIL ENGINEER, experienced building construction, dealers position Eastern area or Northwest coast. PW-4469, Engineering News-Record.

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CIVIL SANITARY Engineer: M.A.S.C.E.; C.E.; M.C.E.; M.S. in P.H.E. Registered in three states. Twenty-five years construction, engineering, engineering teaching and administrative experience. PW-4464, Engineering News-Record.

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PW-4534, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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PW-4570, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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GENERAL SUPERINTENDENT 52, with a thorough experience in that capacity, on public, commercial and industrial work, including school, hospitals, housing, power plants and government projects. Concrete and masonry specialist, with ability to minimize overhead and construction costs. References. PW-4344, Engineering News-Record.

MAINTENANCE AND Schedule Engineer—6 years experience in petroleum refinery; 2 years Sanitary Engineering design. Available after July 1. PW-4526, Engineering News-Record.

STRUCTURAL ENGINEER, PE, 29 experienced steel and concrete designer, seeks more responsible position, N.Y.C. Area. PW-4574, Engineering News-Record.

SELLING OPPORTUNITY WANTED

CIVIL ENGINEER, 29, married, college graduate, 4½ years experience in design, estimating and selling steel building products, (roof decks, joists, sash, bars, wire mesh) desires sales position. RA-4573, Engineering News-Record.

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CIVIL ENGINEER, licensed NY desires work at home. Steel & concrete design. PTWW-4514, Engineering News-Record.

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Structural Engineer, MIT graduate in Civil Engineering, Registered as Professional Engineer in New York State and Connecticut, with office and small staff in New York City, 20 years experience domestic and abroad in steel construction, reinforced concrete and power plant design, seeks associate on partnership basis with contacts to increase business volume. BO-4468, Engineering News-Record.

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1—D8, 8R Hydraulic dozer.
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VOL. 1 NO. 3

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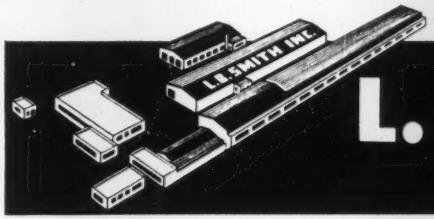

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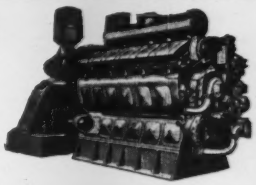

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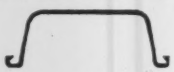

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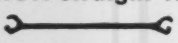

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(make an offer on drier, dust collector, & mixer)	
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1—T-6 International Crawler Type Tractor with 50" tread, 12" over-lapping flat shoes, electric starting attachment, muffler, crankcase guard, front power take-off coupling, 2-speed reverse transmission. Equipped with: Braden Model M8H-18C Heavy Duty Friction Clutch Winch with operating controls:
1—234' Beaver-Art Metal heavy duty double tower complete with one 3-wheelbarrow cage, double cathead with 20" sheaves and double foot block with 20" sheaves.
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66—6' 6" tower ladders.
24—Single landing panels.
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2—Clyde heavy duty hoists H frame, two drum-powered by Waukesha Model 2140 GKU engine six-cylinder, 102 horsepower at 1500 RPM; complete with electric starter, battery, battery box, controls, etc.

For Further Information & Inspection

Contact: Mr. Jackson, Carlton House, Pittsburgh, Pa. Phone Gilfant 1-6060 or Ring Engineering Co., Wash., D. C.

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1—Rex 8" Pumpcrete Machine, Serial No. CPD-175—Electric drive and 1200 ft. 8" pipe and fittings.
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OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10:30 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY

Bids: June 20, 1952

New York State Highway Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time on Friday, June 20, 1952 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. NICKERSON, District Engineer, 353 Broadway, Albany, N. Y.				
Schenectady	D.A. 52-2	Access Road to Alco Testing Grounds Proj. AD-2	0.76	Asp. Conc. Ty. 1A, Opt.	$4,500 Plans $10	$87,000
		DISTRICT No. 4				
		J. P. LARSEN, District Engineer, Barge Canal Terminal, Rochester, N. Y.				
Livingston	L.S.P 52-1	Letchworth State Park: East Entrance Road, North End	1.73	Bit. Mac. Pen. Method	$7,000 Plans $10	$126,000

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

Bids: June 26, 1952

Route 25, Section 30D

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 25, SECTION 30D (TRAFFIC CONTROL)

Route 25, Section 30D, Traffic Control, Passaic River Bridge and Approaches, in the City of Newark and Town of Kearny, Essex and Hudson Counties. Length 0.802 mile. The principal items of construction are:

Roadway Items

Estimated:
- 1,449 cu. yds. Roadway Excavation—Earth
- 888 tons Bituminous Concrete Surface Courses
- 2,554 sq. yds. 10" Rein. Conc. Pavement Surface
- 4,442 lin. ft. Concrete Curbs

Bridge Items
- 1,322 sq. ft. Steel Grid Flooring
- 2,660 lbs. Structural Steel

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Thursday, June 26, 1952, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: July 15, 1952

City of Chicago Invites Bids for Three (3) Sections of Tunnel Construction for Central District Filtration Plant, Chicago, Illinois

Sealed proposals on three (3) sections of tunnel construction will be received by the Department of Purchases, Contracts and Supplies until 11:00 A.M., Central Daylight Saving Time, July 15, 1952, at Room 401, City Hall, Chicago, Illinois, at which time and place all such proposals will be opened and read publicly.

Brief descriptions of the three tunnel sections are as follows:

Specifications No. 80.391-51-1, Section "A", furnish all labor and materials required for the construction of four (4) shafts in Filtration Plant site area 400 feet north of Navy Pier and 500 feet east of Lake Shore Drive; one (1) 20-foot tunnel in rock, 1400 feet in length; three (3) 16-foot tunnels in rock approximately 11,400 feet in length and one (1) 16-foot tunnel in clay approximately 80 feet in length together with all other work appurtenant thereto.

Specifications No. 80.391-51-2, Section "B", furnish all labor and materials required for the construction of 14-foot work shaft, two (2) lengths of 16-foot tunnel in rock, with total length of approximately 14,300 feet, one extending southeasterly to connection with Tunnel Section "A" and the other extending northwesterly to connection with Tunnel Section "C", together with all other work appurtenant thereto.

Specifications No. 80.391-51-3, Section "C", furnish all labor and materials required for the construction at location from two (2) shafts in Park Area south of Wilson Avenue and east of Clarendon Avenue, two (2) 16-foot tunnels in rock, with total length of approximately 4700 feet; one (1) 12-foot tunnel in rock, 200 feet in length; one (1) 8-foot tunnel in clay approximately 246 feet in length and one (1) by-pass structure, together with all other work appurtenant thereto.

Bidders may bid on any one section, combination of sections or on all three (3) sections.

A proposal shall be accompanied by a bid deposit in cash, cashier's check, certified check or Comptroller's Certificate of monies owed the particular bidder in amounts as follows:

Section "A"—	$185,000.00
Section "B"—	145,000.00
Section "C"—	60,000.00
Total for Sections "A", "B", and "C"	390,000.00

Checks are to be drawn on some responsible bank located and doing business in the United States and are to be made payable to the Purchasing Agent, City of Chicago.

A deposit for plans and specifications of $50.00 is required for each section or $150.00 for all three sections. These deposits are returnable upon return of plans and specifications.

All communications and requests for plans and specifications should be addressed to the Purchasing Agent, Department of Purchases, Contracts and Supplies, Room 401, City Hall, Chicago 2, Illinois.

JOHN F. WARD,
Purchasing Agent.

Bids: July 1, 1952

Water Filtration Plant

Sealed bids will be received by the Palisades Interstate Park Commission, Administration Headquarters, Bear Mountain, New York, until 3:00 P.M. D.S.T. July 1, 1952, for the construction of a water filtration plant in Bear Mountain State Park, Orange County, New York.

Work includes concrete building, pumps, filters and auxiliary equipment necessary for a 1.5 m.g.d. plant.

Full information, specifications and proposals may be secured at Administration Headquarters, Bear Mountain, New York. Payment for plans and specifications is $10.00.

THE COMMISSION RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS RECEIVED.

COMMONWEALTH OF MASSACHUSETTS. Department of Public Works. NOTICE TO CONTRACTORS: Sealed proposals for State Highway, Dike, and Underpass Construction in the Town of WEST SPRINGFIELD, U1 286(7), will be received at Room 427, 100 Nashua Street, Boston, Mass., until 12 o'clock noon (DST) of Monday, JUNE 23, 1952, and at that place and time publicly opened and read. Plans and proposal forms: $20.00, amount returnable only to bidders who return plans in good condition within three days after bids are opened. Proposal guaranty: $100,000. Minimum wage and dump truck rates have been established. Complete information at office of Department. Right reserved to waive any informality in or reject any or all proposals. An award will not be made to a Contractor who is not equipped to undertake and complete the work.

By: WILLIAM F. CALLAHAN, Commissioner of Public Works.
June 7, 1952.

OFFICIAL PROPOSALS

Bids: July 3, 1952

Fuel Oil Tank

THE PORT OF NEW YORK AUTHORITY
FURNISH ALL LABOR AND MATERIAL REQUIRED TO INSTALL ONE 10,000 GALLON FUEL OIL TANK
NEW YORK INTERNATIONAL AIRPORT
CONTRACT O & M—154
PROPOSAL NO. 824

Sealed proposals for furnishing all labor, material and equipment to instal one 10,000-gallon fuel oil tank at New York International Airport, Jamaica, N. Y., will be received at the office of the Director of Purchase of The Port of New York Authority, Room 1402, 111 8th Ave., New York 11, until 11 A.M., (EDST), Thursday, July 3, 1952, at which time and place said proposals will be publicly opened and read. Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, June 19, 1952

Bids: July 3, 1952

Route S-41, Section 4-B

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Construction of Route S-41, Section 4-B, Interchange at Route 43 and Taunton Road, Second Stage, Waterford and Winslow Townships and Borough of Berlin, Camden County. Federal Project No. F-183(3). Length 0.587 mile. The principal items of construction are;

Estimated:

Roadway Items
20,237 cu. yds. Roadway Excavation-Earth
6,368 cu. yds. Subbase
23,197 sq. yds. Waterbound Macadam Base, 4" thick
23,197 sq. yds. Waterbound Macadam Inter. Course
3,912 ton Pavement, Type MA-BC-2
1,223 sq. yds. 9" Rein. Conc. Pavement
2,014 lin. ft. 18" Rein. Conc. Pipe
15,253 lin. ft. Concrete Curbs

Bridge Items
648 cu. yds. Concrete in Structures
33,212 lbs. Rein. Steel in Structures
58,000 lbs. Structural Steel

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Thursday, July 3, 1952, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 23, of the Revised Statutes of New Jersey and supplements and by P. L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Roads, Department of Commerce, as outlined in the specifications which provisions require that labor be employed from lists furnished by the State Employment Service, 910 Broadway, Camden, N. J. and 223 Belleview Avenue, Hammonton, N. J. The attention of bidders is directed to the special provisions covering 'subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: July 3, 1952

Rehabilitation of Doors at Domestic Terminal Building La Guardia Airport

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M—156
PROPOSAL NO. 828

Sealed proposals for the rehabilitation of doors at the Domestic Terminal Building, La Guardia Airport, Flushing, New York, will be received at the office of the Director of Purchase of The Port of New York Authority, Room 1402, 111 8th Ave., New York 11, until 11:00 A.M. (EDST), Thursday, July 3, 1952, at which time and place proposals will be publicly opened and read. Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, June 19, 1952

Bids. June 30, 1952

Repairs to Fenders Victory Bridge

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

For the repairs to Fenders at the Amboy Bridge (Victory Bridge) on Route 4 over the Raritan River, between Perth Amboy and Sayreville, Middlesex County. The principal items of work are:

Estimated:
190 lin. ft. Treated Timber Piles
370,775 ft. B.M.—Treated Timber (various sizes)

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Monday, June 30, 1952, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3736) will be received at Denver, Colorado, until July 15, 1952, for furnishing one 50-ton gantry crane for Nimbus Power Plant, Central Valley Project, California. Delivery is desired within 450 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

St. Paul District, Corps of Engineers, US Army, 1217 U. S. Post Office & Custom House, St. Paul 1, Minnesota—Sealed bids will be received at this office until 2:00 P.M., C.S.T., 24 June 1952, and then publicly opened, for Apron Baffle Wall and Scour Protection at Dam at Locks and Dam No. 1, Mississippi River, Minneapolis, Minnesota. Information on request.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3734) will be received at Yuma, Arizona, until July 10, 1952, for furnishing labor and materials for earthwork, concrete lateral lining, and structures, Unit 2, Mohawk Distribution System, Wellton-Mohawk Division, Gila Project, Arizona. Location: Approximately 10 miles east of Wellton, Arizona. Principal items are: 110,000 cu.yds. excavation; 500 cu.yds. concrete in structures; 5,300 cu.yds. concrete in lining; 32,000 lbs. metalwork; and other work. Completion time 300 days. For particulars, address Bureau of Reclamation, Yuma, Arizona; or Building 53, Denver Federal Center, Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION. NOTICE IS HEREBY GIVEN that sealed bids on Invitation No. 703S-229 for furnishing and delivering plan and profile drawings for Sinclair-Westvaco Transmission Line, Transmission Division, Wyoming, Missouri River Basin Project, will be mailed to P. O. Box 280, Casper, Wyoming, or delivered to the office of the Bureau of Reclamation in time for the public opening at 10:30 a.m., Mountain Standard Time, July 8, 1952, at the office of the Bureau of Reclamation, Reclamation Center, Casper, Wyoming. Copies of the standard forms and of the invitations may be obtained from the following offices of the Bureau of Reclamation: Avery A. Batson, Regional Director, Building No. 46, Denver, Federal Center, Denver, Colorado; and I. J. Matthews, District Manager, P. O. Box 280, Casper, Wyoming. No charge for copies of the invitations furnished for bidding purposes: for all others $0.25 per copy, not returnable. Payments should be made by check or money order payable to the Treasurer of the United States.

Make Plans Accessible to Distant Bidders

Plans and specifications for inspection by distant bidders may be filed at any of ENGINEERING NEWS-RECORD offices without charge. Or a sufficient supply may be deposited at such of our offices as seem desirable subject to your usual requirements in the matter of deposits, etc. (We assume full responsibility for return of plans or collection and return of deposits).

OFFICIAL PROPOSALS

Bids: June 26, 1952

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway & Public Buildings Laws, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time on June 26, 1952 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 11th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. Nickerson, Dist. Engr., 333 Broadway, Albany, N. Y.				
Essex	FARC52-52	Willsboro-Keeseville, Pt. 1, S. H. 1687 Proj. F-407(6)	3.13	Asp. Conc., Ty. 1A, Opt.	$6,000 Plans $10	$102,000
Rensselaer	FARC52-53	East Nassau-Brainard, S. H. 439 East Nassau, S. H. 196 Hoags Corners, S. H. 55 Proj. F-418(3)	7.50	Asp. Conc., Ty. 1A, Opt.	$12,000 Plans $10	230,000
Warren	FARC52-58	Glens Falls-East Lake George, Pt. 2, S. H. 1813 Proj. S-1022(2)	5.20	Asp. Conc., Ty. 1A, Opt.	$9,000 Plans $10	165,000
		DISTRICT No. 2				
		Lacy Ketchum, Dist. Engr., 109 North Genesee St., Utica 1, N. Y.				
Fulton	FARC52-59	Meco-Caroga Lake, S. H. 618 Proj. S-700(2)	5.40	Asp. Conc., Ty. 1A, Opt.	$12,000 Plans $10	213,000
Oneida	FARC52-60	State Bridge-Verona Sta., S. H. 8432 Proj. F-618(3)	2.73	Asp. Conc., Ty. 1A, Opt.	$6,000 Plans $10	116,000
		DISTRICT No. 3				
		William Robinson, Dist Engr., Weigh Lock Building, Syracuse, N. Y.				
Cortland	FARC52-40 RC52-48	Blodgett Mills-Cortland, S. H. 881 McGraw ville, S. H. 378 Proj. F-481(5)	3.05	Asp. Conc., Ty. 1A, Opt.	$8,000 Plans $10	153,000
		DISTRICT No. 5				
		C. R. Waters, Dist. Engr., 65 Court Street, Buffalo, N. Y.				
Cattaraugus	FARC52-49	Arcade-Farmersville, Pt. 2, S. H. 8115 Proj. F-180(2)	1.75	Asp Conc., Ty. 1A, Opt. = 1.71 Mi. Misc. Work = 0.04 Mi.	$4,500 Plans $10	82,000
Chautauqua	FARC52-47	Cutting-French Creek, S. H. 939 Proj. F-727(2)	2.87	Bit. Mac. Ty. 1, Pen. Meth.	$7,000 Plans $10	131,000
Chautauqua	FAS852-8	West Oak Hill Co. Rd. 120 Proj. S294(1)	1.80	Bit. Mac. Ty. 1, Pen. Meth. = 1.79 Mi. Misc. Work = 0.01 Mi.	$4,500 Plans $10	78,000
Niagara	FARC52-41	Cambria-Lockport, S. H. 1045 Sadalsons Cors.-Cambria Center, S. H. 9014 Proj. S-236(2)	2.34	Asp. Conc. Ty. 1A, Opt.	$9,000 Plans $10	170,000
		DISTRICT No. 6				
		H. F. Brumm, Dist. Engr., State Office Building, Hornell, N. Y.				
Schuyler & Yates	FARC52-62	Watkins-Yates Co. Line, S. H. 5334-5334A North Reading-Dundee, Pt. 1, S. H. 5018 Proj. S-889(2)	5.35	Asp. Conc., Ty. 1A, Opt.	$19,000 Plans $10	322,000
Steuben	FARC52-63	Wayland-Dansville, Pt. 1, S. H. 1292 Proj. F-510(2)	3.41	Asp. Conc., Ty. 1A, Opt.	$14,000 Plans $10	245,000
		DISTRICT No. 7				
		Roy F. Hall, Dist. Engr., 444 Van Duzee St., Watertown, N. Y.				
Clinton	FARC52-42	Plattsburg-Chazy, Pt. 2B, S. H. 8088 Proj. F-43(3)	0.98	Asp. Conc., Ty. 1A, Opt. = 0.94 Mi. Misc. Work = 0.04 Mi.	$6,000 Plans $10	107,000
		DISTRICT No. 8				
		J. S. Bixby, Dist Engr., Pleasant Valley Road, Poughkeepsie, N. Y.				
Columbia	FARC52-55	Claverack-Kinderhook, Pt. 1, S. H. 1919 Claverack-Kinderhook, Pt. 2 & President Van Buren Farm-Valatie, Pt. 1, S. H. 8497 Proj. F-587(4)	11.70	Asp. Conc., Ty. 1A, Opt.	$45,000 Plans $10	838,000
Orange & Rockland	PIP 52-2P	Palisades Interst. Pky Pts. 1 & 2 (Rte. 45-Queensboro)	(2.90 Acc) 9.64	8" Cem. Conc. Pavt. Var. Widths = 9.60 Mi. Grading = 0.04 Mi. (Asp. Conc., Ty. 1A, Opt. Acc. = 0.73 Mi.) (Cem. Conc. Pavt. Acc. = 2.17 Mi.)	$135,000 Plans $100	2,456,000
Westchester	FARC52-44	Harts Cors.-White Plains, S. H. 1370 Proj. F-643(12)	0.83	Asp. Conc., Ty. 1A, Opt.	$3,300 Plans $10	61,000
		DISTRICT No. 9				
		F. W. Donovan, Dist. Engr., 71 Frederick St., Binghamton, N. Y.				
Broome	FARC52-56	Bettsburg-McClure, Pt. 1, S. H. 8266 Proj. F-360(7)	5.94	Asp. Conc., Ty. 1A, Opt.	$15,000 Plans $10	287,000
Delaware	FARC52-45	Andes-Margaretville, S. H. 8017 Proj. F-69(5)	4.75	Asp. Conc., Ty. 1A, Opt.	$14,000 Plans $10	257,000
Delaware	FARC52-39	Deposit-Hales Eddy, S. H. 5045 Hales Eddy-Hancock, S. H. 5167 Proj. F-336(12)	7.31	Cem. Conc. Pavt. 7.11 Mi Asp. Conc. Ty 1A, Opt. 0.20 Mi.	$185,000 Plans $25	3,400,000
Otsego	FARC52-57	Colliers-Maryland, SH 5240-5240A Proj. F-471(7)	5.69	Asp. Conc., Ty. 1A, Opt.	$13,000 Plans $10	239,000
Sullivan	FARC52-46	Narrowsburg-Callicoon, Pt. 3, S. H. 8449 Callicoon-Long Eddy, Pt. 1, 2, 2A & 3, S. H. 8501-8494-8508 Proj. F-502(13)	4.46	Bit. Mac. Ty. 1, Pen. Meth.	$7,000 Plans $10	133,000
		DISTRICT No. 10				
		J. J. Darcy, Dist Engr., Montauk Highway at Little East Neck Rd., Babylon, L. I., N. Y.				
Nassau	PSC5466 & 14337	Elim. of the Gr. Crossings of L. I. Rail Terrace Pl. & Central Av. in Vill. of Valley Stream with the Long Island Railroad	1.48	8" Cem. Conc. Pavt. 44' Var. Wide = 0.14 Mi. Elev. Tracks 1.34 Mi. RR Sep. 65' Plate Girder RR Sep. 66' 6½" Plate Girder	$120,000 Plans $25	2,250,000
Nassau	BP 52-49	Point Lookout Beach Protection	....	3 Stone Jetties	5% of Bid Plans $10	741,000

OFFICIAL PROPOSALS

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders". When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated. The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

Bids: June 26, 1952

Viaduct, Route 4

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

VIADUCT, ROUTE 4 PARKWAY, SEC. 9H

Construction of Viaduct at Connection to Route S-24 on Route 4 Parkway, Section 9H, in Union Township, Union County. The principal items of construction are:

Estimated:
- 3,507 cu. yds. Concrete in Structures
- 447,460 lbs. Reinforcement Steel in Structures
- 8,400 lin. ft. Timber Piles
- 1,248 cu. ft. Concrete Cribbing

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Thursday, June 26, 1952, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of **plant and equipment with their bid**.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

(Continued on following page)

OFFICIAL PROPOSALS

Bids: June 26, 1952

General Construction

Notice is hereby given that sealed proposals will be received in the office of the Director, Division of Purchase and Property, Room 318, State House, Trenton 7, New Jersey, for the following:

General construction, miscellaneous metal, ornamental metal, plumbing and drainage, heating and ventilating, and electrical work for a T. B. Unit for the State Colony at Woodbine, New Jersey.

Bids for the above will be received at the office of the Director, Division of Purchase and Property, State House, W. State St., Trenton 7, New Jersey on Thursday, June 26, 1952 at two (2:00) D.S.T. and will be opened and read immediately thereafter. Bids must be made on the standard proposal form, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than 5% of the amount of the bid, cash, in the amount of 5% of the bid or a bid bond in the amount of 5% of the bid, and must be delivered at the above place on or before the hour named, as no bid will be accepted after the hour specified. Bids not submitted on the standard proposal form or enclosed in other than special addressed envelopes will be considered informal and will be rejected. The Director reserves the right to reject any or all bids and to award contract in part or whole if deemed to the best interests of the State to do so. The successful bidder will be required to qualify for surety bond in the full amount of the cotract, of a company authorized to do business in the State of New Jersey.

Plans and specifications, form of bid, contract and bond for the proposed work are on file and may be obtained upon application to the Director, Division of Purchase and Property, State House, Trenton, New Jersey on deposit of twenty-five dollars ($25.00) for each set; this amount to be refunded to the bidder upon receipt of same in good condition within 30 days after the award of the contract.

DEPARTMENT OF THE TREASURY
Division of Purchase and Property
Fred V. Ferber, Director.

Bids: June 26 1952

Soil Explorations Spec. SM-37

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Daylight Saving Time, on June 26, 1952 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE NEW YORK STATE THRUWAY, CATSKILL SECTION, SUBDIVISION 9, HAMPTON TO NEWBURGH, ORANGE COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-37.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.
(c) Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $34,670.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,735.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. TALLAMY
Superintendent of Public Works

BUSINESS AND FINANCE

$85-million slum clearance heads week's major projects

Contracts were signed in New York City last week for four slum clearance projects that will provide middle-income dwellings for 6,500 Manhattan families. Estimated cost of the four projects is $85 million.

Here are the four projects:

Corlears Hook, bounded by Lewis St., Williamsburg Bridge, Franklin D. Roosevelt Dr., Cherry St., and Jackson St.—estimated cost $18 million. The project will provide 1,600 co-operative apartment units.

North Harlem, between Lenox and Fifth Aves., from W. 139th St., to W. 142nd St., to cost $16 million and provide 1,300 co-operative apartment units.

Harlem, between Lenox and Fifth Aves., from W. 132nd St. to W. 135th St., to cost $14 million and provide more than 1,100 apartment units.

West Park, between Central Park West and Amsterdam Ave., from W. 97th St. to W. 100th St., to cost $37 million and provide 2,560 apartment units.

• **Plan Park Forest expansion**—Also in the week's limelight was an announcement by American Community Builders, developers of Park Forest, Illinois, that a $25-million expansion of the community is planned.

The initial program calls for $12 million in home construction. Later in the year, an expansion of this program, aggregating an additional $10 million in home construction and $3 million in commercial buildings, schools and other facilities, is expected to be announced by ACB.

Park Forest is a completely planned community 27 miles south of Chicago's Loop.

• **New lighting plant**—On the industrial scene, Westinghouse Electric Corp., announced plans to build an $8-million plant for manufacture of industrial and commercial lighting equipment at Vicksburg, Mississippi. Westinghouse officials say it will be the largest plant in the nation devoted exclusively to this purpose. It is designed to permit doubling of its size in the future. Construction is expected to get underway in August.

• **Steel company gets loan**—The Reconstruction Finance Corp. announced that it had approved a loan of $8.5 million to the Lone Star Steel Co., Dallas, Texas.

Seek financing for $85-million bridge

Michigan state officials this week were hopeful of a favorable reaction from the Reconstruction Finance Corporation on their application for an $85-million loan to finance construction of a five-mile bridge across the Straits of Mackinac.

The structure, which would provide the first link (other than by boat) between Michigan's Upper and Lower peninsulas, has been in planning stages under the aegis of a Mackinac Bridge Authority, created by the state legislature two years ago. Under discussion for many years, the structure would carry four lanes of traffic from Mackinac City on the Lower peninsula north to St. Ignace.

• **RFC preferred**—Bridge Authority officials—in particular Prentiss M. Brown, chairman—were hopeful that the Reconstruction Finance Corporation would approve the loan proposal.

Bridge authority's reasoning was simple:

Under almost any private loan arrangement, the entire amount would be borrowed at once, with resulting interest payments that might run to $2 million or more a year.

But an RFC loan could be arranged under which the government agency would only dole out funds to the authority as needed, with interest rates accruing on the total lent each time, rather than on the full amount at once.

However, Brown said, the authority has prepared alternate plans, in the event RFC turns down its application. These would include financing entirely by public sale of bonds, and a combination of federal loan and public bond sales.

In either case, borrowings would be repaid through revenue bonds (which the authority was authorized to issue by special legislative act last year). Initial expenses would include about $2 million for test borings and completion of plans.

GROSS-MORTON TEAM responsible for the Crosland Park project in Aiken, South Carolina, includes (from left to right): James Morton, Robert Gross, Edward J. Dennis, president of Crosland Park and vice president and general manager of the Gross-Morton firm, Alan Morton, and Richard Morton.

N. Y. builder sets up southern branch to supply housing for H-bomb workers

ASSEMBLY-LINE METHODS were adopted by Gross-Morton. Here a mobile mixer solves the problem of obtaining the concrete as fast as it is needed. The machine mixes a cu yd of concrete a minute—moves frequently (approximately every 30 minutes).

Uprooting of industrial centers by national emergency conditions is resulting in the migration of some major builders away from the metropolitan areas—notably in the East.

One of these movements has been that of the Levitt group from Long Island, New York, to the Morrisville, Pa., area.

Not so well-known, but equally important, is the move of the Gross-Morton Co.—one of the largest mass builders in the New York area—to Aiken, S. C.

At Aiken, Gross-Morton is tackling the problem of housing the thousands of workers at the Atomic Energy Commission's huge Savannah River H-bomb plant which is now under construction.

• **In to stay**—The significance of the Gross-Morton move is that the company has not gone into the Aiken area on a "one-shot" basis. Instead, the company has set up permanent headquarters at Aiken, established a resident vice-president on the scene, and gives every indication of intending to remain as an active builder in the South.

Edward J. Dennis, Gross-Morton's vice president, has purchased a farm in the Aiken area, set up a local office and taken other steps to make himself a legal resident.

The company itself started its operations in the area by purchasing a 198-acre farm just outside the Aiken city limits. Gross-Morton then engaged an Atlanta engineer, Eugene R. Martini, to plan the 550-home development (named Crosland Park) and set to work (with considerable success) to gain local acceptance.

That acceptance included an agreement by the City of Aiken to extend its limits to include the development, so that water and other facilities could be supplied.

The firm took another unusual step: it sent its "second generation" to Aiken to live on the job, work with Dennis on the Crosland Park project—and to serve as evidence of faith in the future of work in the South.

Actively on the job are the three sons of Lawrence Morton, partner of the firm: James, Alan and Richard Morton; and Robert Gross, son of George M. Gross, president.

Though located about a half-mile from the main business district of Aiken, the builders have planned and are already erecting the first units of a new shopping center.

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(SIKA No. 2, SIKA No. 4A) Leaks are easily sealed on the exposed side with quick-setting SIKA mortar. It is not necessary to relieve pressure. SIKA No. 2 is used against heavy pressure or bleeders, SIKA No. 4A against seepage or moderate pressure.

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School construction boom puts

With a continuing boom in school construction, the spotlight is on the cost of building new educational facilities.

Design requirements, labor wage rates, material prices and other factors vary from one area of the country to another—and even within the same city over a period of time—making it difficult to accurately compare school costs.

But a case study has now been found which minimizes most of these variables.

Last November and December, the New York City Board of Education awarded contracts for construction of 18 school buildings.

The designs and specifications of the buildings were so similar that fair comparisons could be made, and because of the short period of time during which the awards were made, labor rates and material prices were almost constant.

Another factor that made the bids realistic was the sharp competition. New York City, more than any other section of the country, relies heavily on commercial construction. With government controls stifling this type of work, contractors sharpened their pencils to figure the school jobs.

Here are some of the high points of the New York lettings:

The cost in New York City for three-story elementary schools ranged from $1.11 per cubic ft for buildings with "normal-size" auditoriums and gyms built for a larger capacity than presently required, to meet anticipated future needs.

The cost per pupil ranged from $1,447 for buildings with normal-size auditoriums and gyms to $1,916 for those with "expansion" auditoriums and gyms.

Schools designed for 750-999 students had lower "cube" costs, but higher costs per pupil than buildings designed to handle a larger number of students.

Junior high schools were constructed within a narrow range of costs per cubic ft, with a minimum of $1.32 and a maximum of $1.38. The average was $1.36 per cu ft.

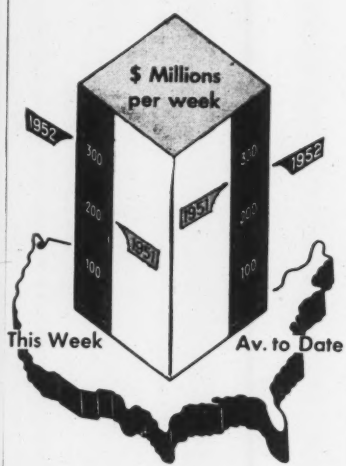
These schools, designed to accommodate from 1,500 to more than 2,000 pupils, had a lower range of cost per pupil than the elementary schools.

Per pupil costs ranged from $1,408 to $1,655 for the five junior high schools, compared to the range of $1,447 to $2,451 for elementary schools.

• For details see tables on page 135 and chart on page 136.

Activity This Week

As reported to ENR
(in millions of dollars)



Contracts by type of work

	This Week	Cumulative 25 wks 1952	1951	% chge
Waterworks	$4.3	$114.4	$113.3	+1
Sewerage	11.3	122.0	158.0	−23
Bridges	9.6	179.5	141.7	+27
Highways	32.2	684.3	516.1	+33
Earthwork, waterways	17.4	270.0	267.9	+1
Buildings:				
Public	71.8	900.3	1,080.3	−17
Housg., pub.	2.9	427.8	283.2	+51
Housgs. priv.	43.6	1,402.4	983.1	+43
Commercial	8.5	300.2	339.5	−12
Industrial	84.9	1,407.0	2,274.6	−38
Unclassified	19.2	609.7	808.5	−25
Total	**$305.7**	**$6,417.6**	**$6,966.2**	**−8**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR indexes		Base Year = 100 1913	1926	1949
Constr. cost.	June	561.69	270.00	117.75
	May	557.11	267.80	116.79
Bldg. cost.	June	412.50	222.98	117.26
	May	410.30	221.80	116.65
Volume	May	554	225	160

accent on costs; N.Y.C. offers case study

I Cost of schools built in New York City

Elementary schools

	no.	per cu ft min	per cu ft aver	per cu ft max	per pupil sta min	per pupil sta aver	per pupil sta max	capacity, pupil stas min	capacity, pupil stas aver	capacity, pupil stas max
1947	(9)	$1.16	$1.25	$1.56	$1,255	$1,517	$1,991	558	1,162	1,550
1948	(5)	1.20	1.30	1.43	1,399	1,581	1,784	806	1,094	1,433
1949	(12)	1.03	1.18	1.40	1,148	1,334	1,638	868	1,181	1,588
1950	(11)	1.04	1.20	1.55	957	1,357	1,612	302	1,036	1,581
1951	(24)	1.11	1.39	1.69	1,447	1,710	2,451	358	885	1,274
Junior high schools										
1947	(2)	1.21	1.23	1.25	1,270	1,277	1,284	1,810	2,068	2,326
1948	(1)	1.32	1.32	1.32	1,623	1,623	1,623	1,518	1,518	1,518
1949	(3)	0.99	1.09	1.26	1,261	1,380	1,553	1,518	1,819	1,998
1950	(1)	1.07	1.07	1.07	1,210	1,210	1,210	2,012	2,012	2,012
1951	(5)	1.32	1.36	1.38	1,408	1,511	1,645	1,588	1,842	2,020

II School building costs, New York City 1951

By type, by size, by number of stories

Elementary schools, new, 3-story, incl. auditorium and gymnasium

No.	Size, min-aver-max pupil stations	auditorium-gymnasium	Min-aver-max COST per: Pupil station	class room	cubic foot
4	768-863-962	normal size	$1,559-$1,728-$1,888	$55,565-$61,458-$65,980	$1.11-$1.26-$1.32
3	795-809-856	sized for expan.	1,765- 1,831- 1,916	65,700- 67,110- 69,200	1.32- 1.42- 1.48
10	1,000-1,125-1,274	normal size	1,447- 1,531- 1,636	52,710- 55,824- 59,700	1.22- 1.33- 1.43
Elementary schools, additions					
2	358-499-640	incl. gym	$1,630-$1,860-$2,090	$61,300-$68,088-$74,876	$1.51-$1.58-$1.64
3	460-597-712	aud. & gym	1,570- 1,882- 2,126	58,800- 71,933- 81,600	1.40- 1.48- 1.63
Elementary schools, special type, 1- & 2-story					
2	568-633-698		$1,475-$1,963-$2,451	$54,200-$73,525-$92,850	$1.42-$1.56-$1.69
Junior high schools					
5	1,588-1,842-2,020		$1,408-$1,512-$1,645	$46,620-$53,567-$59,375	$1.32-$1.36-$1.38
High school addition					
1	— 360 —		— $1,665 —	— $66,600 —	— $1.49 —

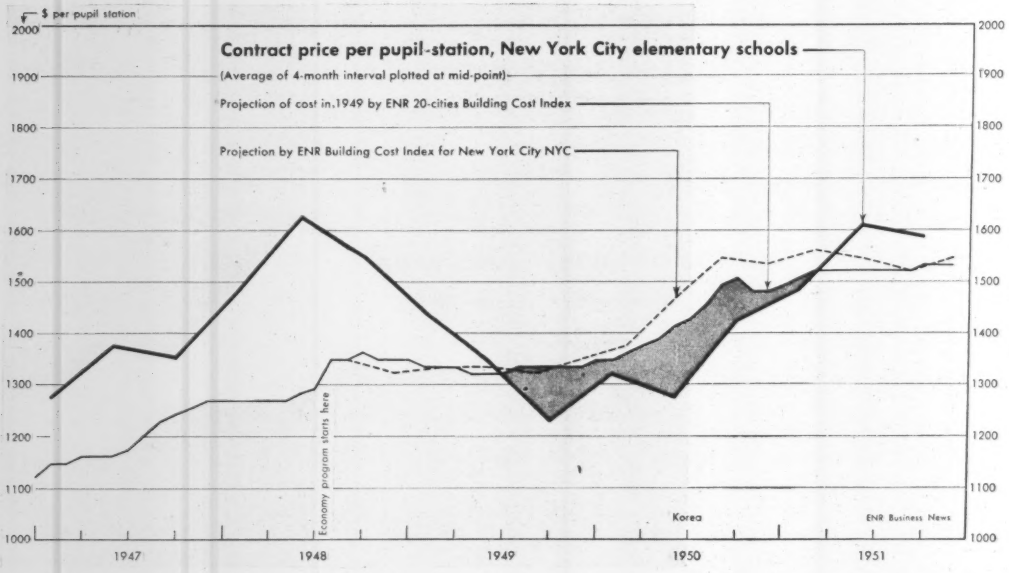
III Heating, plumbing, electrical price ratios compared with percentage of school building contract prices for general construction

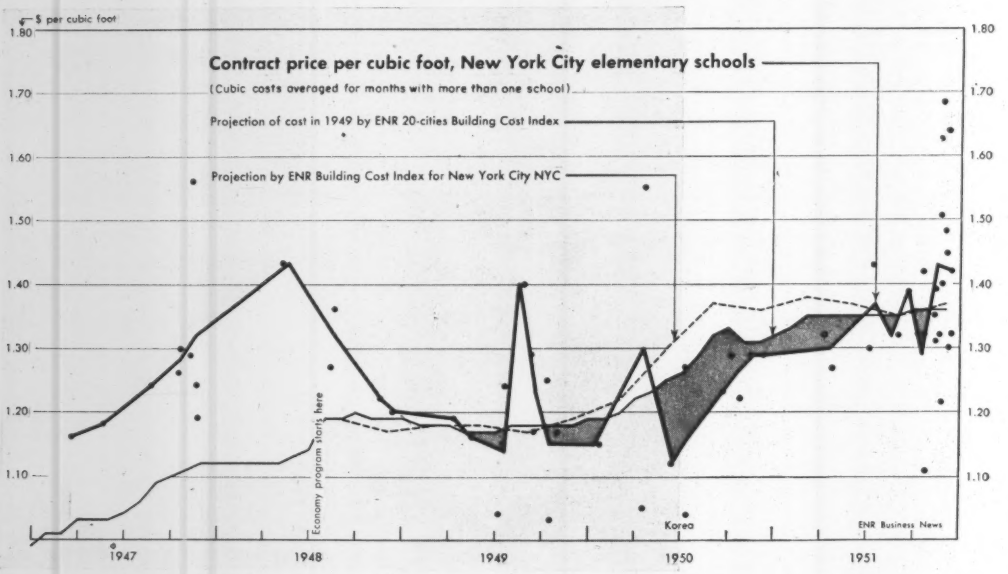
Elementary schools, new, 3-story, incl. audit & gymnasium

Size-pupil stations	Aud-Gym	gen'l constr %	min-aver-max % of total bldg contract price*: heating %	plumbing %	electrical %
768- 962	normal size	74.5-75.3-75.7	10.8-11.0-11.2	6.5-6.8-7.1	6.4-6.9-7.5
795- 856	sized for expan.	74.4-74.7-74.8	11.1-11.6-12.0	6.1-6.2-6.3	7.1-7.5-8.2
1000-1274	normal size	75.6-77.5-78.9	9.8-10.5-11.4	4.8-5.4-5.6	5.4-6.6-7.6
Elementary schools, additions					
358- 640	incl gym	75.1-77.8-81.3	7.5-10.1-12.1	4.3-5.4-6.3	6.5-6.7-6.9
460- 712	incl aud & gym	74.8-76.4-80.1	9.4-11.6-13.2	5.1-6.2-7.2	5.4-5.8-6.0
Elementary schools, special type, 1- & 2-story					
568- 698		74.5-74.6-75.0	11.4-11.8-12.4	6.0-6.3-6.4	
Junior high schools					
1588-2020		74.2-75.5-77.0	9.8-11.2-12.6	4.7-5.0-5.2	6.6-7.3-7.7
High school addition					
360		— 70.4 —	— 15.1 —	— 7.0 —	— 7.6 —

* Excludes abnormal foundation costs

What does it cost to build a school? New York City charts its answers





Based on data from Board of Education, NYC, Office of Coordination of School Construction

● Individual schools.

Milwaukee sells $6 million in bonds at lowest interest rate in city's history

Last week, the city of Milwaukee, Wis., sold a $6-million bond issue at the lowest interest rate of any bond issue in the city's history.

Northern Trust Co. of Chicago headed the syndicate which purchased the bonds.

The syndicate included 11 other financial institutions, including a local bank, Marshall and Ilsley of Milwaukee.

The bonds, divided equally for schools, sewers, and expressways, sold at a net interest cost to the city of 1.3113%.

The bonds bear interest coupons of 1.4%, but the syndicate paid a premium of $29,280 to get the bonds. The issue is made up of 10-year serial bonds with an average maturity of 5½ years.

City Comptroller V. H. Hurless pointed out that the Milwaukee bonds sold for less than the "best government bonds." Ninety-one day Treasury bills sold the previous day at 1.77%.

Milwaukee is rated triple-A, Hurless said. The latest bond issue brings the municipal government obligation to $20 million.

Congress cracks down on Eklutna contract

Congress is trying to crack down on the practice of agencies and bureaus of habitually overspending authorizations and then coming back to Congress for supplemental appropriations.

The House Interior Committee has asked the Attorney General and the Comptroller General for opinions as to whether the Bureau of Reclamation violated the law in contracting beyond the congressional authorization of $20.4 million for the Eklutna, Alaska, hydroelectric project. Expenditure commitments on the project now have reached a total of $23.6 million.

The Bureau of Reclamation has taken the position that it has authority to contract without regard to authorization so long as government liability is contingent upon congressional appropriations.

But many congressmen feel that Congress loses its check over agencies unless it can hold them to staying within expenditures which have been authorized.

Committee members feel that the Bureau of Reclamation is one of the worst offenders and they want the issue settled.

The next question to arise: What happens if the legal experts rule the Bureau of Reclamation was illegally awarding contracts?

Sewer contractor files $200,000 suit

James N. Driscoll Co., a Philadelphia construction firm, has filed a $200,000 damage suit against the city of Detroit, Mich.

Driscoll had a contract to build a $4.8-million sewer in the Southfield-Rouge River area.

In the damage suit filed, the firm charges that it had agreed to obtain essential construction materials for the job through the National Production Authority.

Under a March, 1951, contract, the firm charges that if the city fails to get materials and work is halted three months or more then the contractor is allowed to cancel the contract and receive payment for all work done up to that time.

The construction firm is asking almost $74,000 for work already completed, and $16,000 a month from Oct. 10, 1951, charging these are the average monthly earnings of the company which have been halted because the company's working capital is tied up in posting a bond for the Detroit contract.

The suit filed by Driscoll also asks that the federal bond be canceled.

Engineers recommend 4 Pennsylvania dams

Field offices of the Army Corps of Engineers have recommended the construction in Pennsylvania of four dam and reservoir projects for flood control and other uses.

The proposed projects, with an estimated federal cost of $75 million, would be located on the west branch of the Susquehanna River and tributaries, as follows:

On West Branch, about 2.5 miles upstream from Curwensville, $24.02 million; on Kettle Creek, about 6.7 miles above its mouth, $13.74 million; on Bald Eagle Creek, about one mile upstream from Blanchard, $21.32 million; and on the first fork of Sinemahoning Creek, about 7.9 miles above its mouth.

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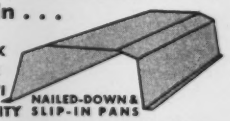

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VA studies uniform rule for houses near airports

The Veteran's Administration has quietly directed its offices throughout the country to submit to Washington headquarters all loan appraisals on GI homes built within four miles of an airport.

The order is to enable the VA to make a full-scale policy review on the insuring of homes planned near military or civil airfields. Once framed, the policy would be in force for all VA lending offices in passing on GI loan applications.

One guide in setting the new policy would be the recent report of the Doolittle Airport Commission which President Truman created after 119 persons were killed in three airplane crashes in the Elizabeth, N. J. area last winter.

• **FHA activities**—Even before the Elizabeth tragedies, the Federal Housing Administration had taken steps to discourage new homebuilding close to airfields. Since last July FHA field offices have generally refused to insure mortgages in homes within a four-mile radius of an airport, if they were beneath the normal takeoff and landing paths.

Building industry spokesmen regard the VA policy as more drastic than anything FHA has done so far. The VA policy is to be a uniform national standard for all GI home loans without regard to location or other special consideratoins. The FHA does permit its field agents to make on-the-spot decisions based on local conditions.

The builders point out that most big cities in the U. S. are surrounded by a dozen or more airfields. In some areas such as New York City's Long Island suburbs, it would be almost impossible to find a good homebuilding site that isn't within four miles of an airfield.

• **Military building**—Pentagon officials are concerned and are fearful that even the flexible FHA regulations may have a serious repercussion on their plans for housing servicemen's families near military posts. Such housing is financed under the FHA program.

Builders and government agencies emphasize that the problem of building near airports is not one of safety.

The reason most often given by the agencies is that mortgage values on property too near airports are subject to depreciation because of the nuisance. The noise and vibration of low-flying airplanes—especially jets—are singled out as the biggest drawback to building houses close to the airports.

Builders are concerned that a uniform policy will only tie the GI program in knots.

Reg X relaxation branded inadequate

Keen disappointment in the new credit regulation issued by the Federal Reserve Board was expressed by many leaders in the homebuilding industry during the past week.

They had expected a much broader relaxation of the restrictions on down payments and pointed out that in some price classifications the change would amount to only $50 less than formerly required.

Alan E. Brockbank, president of the National Association of Home Builders, said the "token" relaxation gave the appearance of an effort to ward off action by Congress to eliminate the control completely.

Brockbank said that the changes would be of little help to most families waiting for easier terms before buying a house. He pointed out that the order reduced the minimum down payment by a non-veteran on a $10,000 dwelling from $1,500 to $1,450.

The United States Savings and Loan League urged that Congress kill Regulation X.

Morton Bodfish, chairman of the league's executive committee said, "So long as the board has not seen fit to terminate this program on its own initiative, it is clearly up to Congress to take the action that it requires."

Emanual M. Spiegel, first vice president of the NAHB, called for reinstatement of the longer 25-year mortgage to cut the monthly payments back to a point where more people could afford them.

Doolittle report

Among the recommendations of the Doolittle commission were these:

That in planning new airports, local authorities should ban all buildings within two and one-half miles of each end of the runway.

A lane 1,000 ft wide and extending one-half mile from the runways should be kept completely clear of obstructions.

For two miles beyond that, the report said, there should be a fan-shaped clearing 6,000 ft wide at the outermost limits, in which all housing would be forbidden.

Schools may get more federal aid

More federal-aid funds for school construction are promised in a bill designed to aid communities that house workers employed on federal projects in a nearby state. Federal aid to these areas now totals $16 million.

The bill, introduced by Rep. C. M. Bailey, would change the provisions of the present law which requires that in determining the size of grants to the state, only children of parents working in the state be counted.

Representative Bailey's bill (H.R. 8145) changes this rule to include children of parents working within "a reasonable commuting distance."

A number of military and atomic energy construction projects, on, or near, state boundaries are affected.

Large construction programs, such as the Atomic Energy Commission establishment at Savannah, South Carolina, and the Navy base at Portsmouth, New Hampshire, have brought many workers into neighboring states.

For example, construction men work in South Carolina but live in Georgia, and many of the civilians and Navy men at Portsmouth base live in nearby Maine.

But under the old rule, neither Georgia nor Maine was eligible for federal aid.

Other hard-hit areas include the school districts of Ohio, near Paducah, Kentucky; Texas districts, near Texarkana, Arkansas; and Virginia and Maryland school districts, near Washington, D. C.

San Francisco to take bids on underground garage

Another underground garage may soon be in the offing for San Francisco, if legal documents presented to the Board of Supervisors last week are approved.

The parking authority asked permission to finance the long-stymied St. Mary's Square garage by private funds. If proper approval is secured, bids will be called June 20 and opened Aug. 4. Estimated cost of the garage is $2.5 million.

UNIT PRICES

Irrigation conduit, Calif.

Modified prestressed concrete cylinder pipe took the contract away from precast and prestressed pipe alternates for 15 miles of work on the South Coast Conduit, part of the Cachuma Project, near Santa Barbara, Calif. under construction by the Bureau of Reclamation. The work is divided into two sections. Bidders on the first were offered three alternates but no bids were received on precast pipe. The low bid for modified prestressed was 5% below the prestressed pipe alternate. On the second section, bids were taken two ways. Here modified prestressed pipe prices were 53% below the single bid received on prestressed pipe.

Work includes excavation and backfilling for pipe trenches; manufacturing, laying and testing 15 miles of 36-in and 27-in pipe; and the construction of Sheffield control station, complete with turnouts, blow-offs, manhole and air valves, special bend encasements and a vent.

A DO-J8 priority rating is available to the contractor for the work and one ton of structural-steel shapes and 15 tons of carbon steel have been allotted for the job.

The contractor must begin work within 30 days after the receipt of notice to proceed and the work must be completed within 450 calendar days with liquidated damages set at $300 per day. Bidders include:

Schedule #2

1C Ventura Pipe LineConstr. Co., Ventura, Calif. $232,208
2 ABC Constr. Co. Inc. & R. J. Daum Constr. Co., Norwalk, Calif. (Jt. venture) 241,998
5 Engineers Limited Pipeline Co., L. E. Webb Constr. Co. Inc., San Francisco (Jt. venture) 402,433

Bids: 4-9-52 Items	Unit	Quantity	Unit prices 1 C	2
Exc. station 0+18.59 to 9+00	cy	1,500	$1.35	$2.88
station 9+00 to 48+00	cy	7,000	2.43	2.88
station 48 to 59	cy	2,000	3.50	2.88
station 58+ to 82+35.83	cy	4,000	2.95	2.88
Backfill	cy	5,200	0.72	1.13
consolidated	cy	1,100	2.50	1.25
compacted	cy	5,500	2.10	2.00
Removal of selected trees	ea	6	150.00	50.00
Right-of-way scarifying	ac	5	45.00	75.00
seeding & fertilizing	ac	5	75.00	100.00
mulching	t	16	60.00	60.00
Dry-rock paving	sy	50	14.00	10.00
Replac pavement hiway no.150	sy	1,200	3.20	6.50
Concrete in structures	cy	70	100.00	50.00
Reinf bars in structures	lb	4,200	0.20	0.16
Conc cond pipe-48"-struct shafts	lf	30	65.00	60.00
Conc culv pipe-48"-stnd strength for struct shafts	lf	50	50.00	50.00
Precast-conc covers 4" thick for 48" pipe structures	ea	7	45.00	40.00
6" thick	ea	2	70.00	60.00
Manhole nozzles, 20", covers	ea	9	500.00	500.00
Nozzles, 6"	ea	5	100.00	120.00
Miscellaneous metalwork	lb	1,700	0.50	0.30
Steel pipe & ftngs, blow-offs	lb	300	0.50	0.70
C. I. pipe & ftngs, 4" to 12"	lb	6,000	0.50	0.20
Stnd iron-body gate valves- 6"125#	ea	5	90.00	90.00
4"125#	ea	4	68.00	75.00
Standard air valves-4"	ea	4	155.00	200.00
Concrete pipe, symbol 36MPC-250	lf	3,750	15.80	16.80
symbol 36MPC-300	lf	770	16.85	18.00
symbol 36MPC-350	lf	3,750	18.25	19.00
Special bends	lf	30	66.00	80.00
Cement, type #2	bbl	900	4.00	4.00

Schedule #4

1C ABC Constr Co Inc. & R. J Daum Constr Co Norwalk, Calif. (Jt. venture) $1,471,450
2 M. Miller Co., Los Angeles $1,521,777
4 Engineers Limited Pipeline Co. & L. E. Webb Constr. Co. Inc. (Jt. venture), San Francisco. 2,585,736

Bids: 4-9-52 Items	Unit	Quantity	Unit prices 1 C	2
Exc, Station 82+35.83 to 87+68.89, 302 to 440, 449 to 483, 487 to 506 and 585 to 594	cy	24,000	1.00	1.65
Exc, Station 147+98.33 to 204+50 and 555 to 567	cy	3,000	1.00	2.00
Exc, Station 204+50 to 218+50, 612 to 698, and 787 to 880	cy	30,000	1.00	1.30
Exc, Station 218+50 to 227+50, 506 to 511+65, 513+30 to 555	cy	9,000	1.00	1.75
Exc, Station 227+50 to 302, 440 to 449, 483 to 487, 698 to 787	cy	25,000	1.00	2.10
Exc, station 567 to 585, 594 to 612, 880 to 903	cy	8,000	1.00	1.50
Exc, 903 to 909+09.88	cy	1,000	1.00	2.50
Backfill	cy	39,000	1.10	0.40
consolidated	cy	7,000	1.20	1.50
compacted	cy	40,000	2.00	1.50
Removal of selected trees	ea	26	50.00	25.00
Right-of-way, scarifying	ac	5	75.00	100.00
seeding & fertilizing	ac	5	100.00	25.00
mulching	t	16	60.00	20.00
Sewer pipe, 8"	lf	210	3.00	3.00
Conc culv pipe, stnd str, 24"	lf	70	10.00	9.50
Dry-rock paving	sy	400	10.00	3.00
Treated timber	Mfbm	0.8	300.00	250.00
Replac pavement hiway #150	sy	8,800	2.50	3.00
Conc in structures	cy	550	50.00	60.00
Reinf bars in structures	lb	30,000	0.16	0.20
Conc cond pipe-48"-struct shafts	lf	150	60.00	60.00
Conc culv pipe stnd strength for struct shafts, 48"	lf	330	50.00	47.00
36"	lf	190	20.00	18.00
30"	lf	100	15.00	12.85
24"	lf	270	11.00	10.50
Precast-conc covers for 48" pipe struct, 4" thick	ea	49	40.00	30.00
6" thick	ea	8	60.00	40.00
Precast-conc covers with conc plugs for 36" pipe structures	ea	41	25.00	25.00
30" pipe structures	ea	23	25.00	20.00
24" pipe structures	ea	58	20.00	15.00
Chain-link fence	lf	200	4.00	3.00
Manhole nozzles, 20" covers	ea	50	500.00	450.00
Nozzles, 12"	ea	5	200.00	175.00
10"	ea	5	175.00	155.00
8"	ea	4	150.00	130.00
6"	ea	45	120.00	100.00
4"	ea	9	100.00	90.00
Miscellaneous metalwork	lb	9,500	0.30	0.55
Elect sys-Sheffield cont station	ls	1	$1,250	$1,000
Stl pipe & ftngs for blow-offs	lb	1,500	$0.70	$0.18
C. I. pipe & ftngs 4" to 12"	lb	32,000	0.20	0.06
with cement mortar lining	lb	60,000	0.20	0.08
Stl pipe Sheffield contr station	lb	22,000	0.70	0.10
C. I. pipe, 14" for waste line	lf	90	9.00	7.00
Stnd iron-body gate valves, 125# 30"	ea	6	$3,200	$2,100
24"	ea	3	2,700	1,500
14"	ea	1	550	475
12"	ea	10	325	300
10"	ea	8	240	240
8"	ea	8	150	150
6"	ea	66	100	120
4"	ea	31	75	80
2"	ea	3	50	40
250#, 4"	ea	6	125	120
250#, 2"	ea	4	75	60
Pressure reduc valves, 30"	ea	2	6,000	8,000
Pressure relief valve, 14"	ea	1	1,750	1,750
Extra-heavy air valves, 4"	ea	6	200	200
2"	ea	4	190	120
Standard air valves, 4"	ea	14	190	200
2"	ea	3	90	120
Venturi meters, 2, and rate-of-flow controller	ls	1	11,000	11,000
Line meters, 12", 150#	ea	5	800	700
10", 150#	ea	1	700	600
8", 150#	ea	1	575	500
6", 150#	ea	9	500	425
10", 250#	ea	2	1,000	850
8", 250#	ea	3	850	630
6", 250#	ea	12	700	600
4", 250#	ea	8	450	435
Concrete pipe, symbol 30MPC-250	lf	20,300	13.00	14.20
symbol 30MPC-300	lf	1,000	14.10	14.45
symbol 30MPC-350	lf	8,200	14.40	15.30
symbol 27MPC-250	lf	2,000	12.10	12.00
symbol 27MPC-300	lf	3,000	12.60	12.60
symbol 27MPC-350	lf	18,000	13.35	14.35
symbol 27MPC-400	lf	16,000	14.10	15.05
Special bends, 30" pipe	lf	160	70.00	60.00
27" pipe	lf	70	75.00	65.00
Welded tee for vent struct	ea	1	300.00	500.00
Cement, type #2	bbl	5,500	4.00	3.60
type #5	bbl	250	4.80	4.35

For a fast, sure start and a whirlwind finish to any pile-driving job, Super-Vulcan is the hammer for you! Twice the number of regular smashing blows per minute does the trick—and on 25 to 35 per cent less steam than the single-acting type of hammer. Super-Vulcan's rapid action, super driving power helps you meet and beat work schedules.

This powerful hammer saves you valuable time other ways, too. Working parts are exposed, instantly accessible for quick lubrication and maintenance. Its durable construction assures you trouble-free operation, eliminates costly breakdowns that hamper progress. And for quick change-over, the open type fits the same leads and uses the same accessories as Single-Acting Vulcan.

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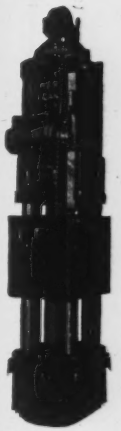

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.
ELSIE EAVES, Manager — *J. A. MAHONEY, Reports* — *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
June 24, Massachusetts
STREETS AND ROADS
June 24, Massachusetts

BIDS ASKED—BUILDINGS

▲ Conn., Hartford—HOTEL—B.A. 7/1—Hotel Statler Co., Inc. 7 Ave. and 33 St., New York, N. Y. (selected list of bidders) reinf.-con. or structural frame hotel, $4,500,000. Plans deposit $75. Bid date changed. CD 6/5.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† Westinghouse Electric Corp., 10 High St., Boston 10, Mass. CA $136,400, furnishing electrical equipment for power plant, Boston Naval Shipyard, CHARLESTOWN, MASS. Dist. P. Wks. Office, First Naval Dist., Navy Bldg., 495 Summer St., Boston 10, Mass. Bids Apr. 23. CD 3/28.

BUILDINGS

LOW BIDS AND CONTRACTS

Town, Town Hall, Johnston, R. I., rejected bids Apr. 22, Lincoln SCHOOL and Franklin SCHOOL, Greenville Ave. JOHNSTON, R. I. LB $428,780. CD 4/30, under LB.

▲ H. V. Collins, 7 Dyer St., Providence, R. I., LB $1,220,504, SCHOOL, Fox Point, PROVIDENCE, R. I. City, Supt. P. Bldgs., 20 Summer St., Providence, R. I. Bids June 2.

▲ Associated Constr. Co., 1010 Wethersfield Ave., Hartford, Conn., CA, $1,595,000, Mfg. PLANT and OFFICE, BLOOMFIELD, CONN. Kaman Aircraft Corp., Bradley Field, Windsor Locks, Conn. Bids May 6. CD 5/28, under LB.

▲ B & Z Constr. Co., 498 Main St., East Hartford, Conn., CA $1,500,000, APARTMENTS, south end of Hillcrest and Abbotsford Aves., WEST HARTFORD, CONN. Hillcrest Terrace Inc., 150 Greenway Terrace, Forest Hills, N. Y. CD 3/10.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
June 26, 30, New Jersey — July 11, Pennsylvania
STREETS AND ROADS
June 24, Maryland — June 25, Delaware
July 11, Pennsylvania

BIDS ASKED—BUILDINGS

Md., Rockville—GYMNASIUM—B.A. 6/26—Montgomery Co. Bd. Educ., County Bldg., gymnasium at Montgomery Blair High School, Silver Spring. $500,000. Plans deposit $20. Rhees Burket, 1223 Connecticut Ave. N.W., Wash., D. C., archt.

▲ Pa., Phila.—HOSPITAL—B.A. 7/9—General State Auth., 18 and Herr Sts., Harrisburg, construct Mercy-Douglass Hospital bldg., 50 and Woodlawn Sts. $2,500,000. Plans deposit $25. Howell L. Shay, Packard Bldg., 15 and Chestnut Sts., Phila., archts. CD 2/12, under LB.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ Gull Contg. Co. Inc., 33-15 Lawrence St., Flushing, N. Y. LB $1,437,485, Taxiway 27 and extend Taxiway "S" at New York International Airport, Cont. NYA-260-001, IDLEWILD, N. Y. Port of New York Auth., 111 8th Ave. New York 11, N. Y. Bids June 10. CD 5/26.

▲ PENNSYLVANIA—State Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,

rejected bids June 6, Schedule 1, substructure 3-span deck I-beam bridge; 2 single span I-beam bridges; 5-span plate girder and I-beam bridge and a 9-span concrete arch and I-beam bridge, Schedule 2, superstructure construction of same bridges, Berks Co. LB, $3,566,618. CD 6/10, under LB.

† MARYLAND—Bureau P. Rds., 1440 Columbia Pike, Arlington, Va.

Curtin Johnson, Inc., 1125 Brentwood Rd., N. E., Wash., D. C., LB $522,152, constr. 4.867 mi. Suitland Parkway from South Capitol St. bridge to Silver Hill Rd., Proj. 1A7-B8-C7, Prince Georges Co. Bids June 5. CD 5/15.

BUILDINGS

LOW BIDS AND CONTRACTS

Fresh Meadow Village Homes, c/o Joseph Unger, archt., 138-22 78 Ave., Flushing, N. Y. Owner Builds. $440,000. 44 HOUSES in area bounded by 199 St., 50 Ave., 56 Ave., Francis Lewis Blvd. and Weeks Lane, AUBURNDALE, N. Y.

Lakeview Ranch Homes, c/o Stanley Klein, archt., 89-31, 162 St., Jamaica, N. Y. Owner Builds. Approx. $450,000. 30 HOUSES, 48 Ave. and 217 St., BAYSIDE, N. Y.

Leon Goldberg, c/o Wuest & Bailey, archts., 32-02 30 Ave., Long Island City, N. Y. Owner Builds. Approx. $500,000. 20 HOUSES on tract on 84 Rd. between Daniels and Smedley Sts., BRIARWOOD, N. Y.

Kingsland Constr. Co., c/o Seelig & Finkelstein, archts., 153 Pierrepont St., Brooklyn 2, N. Y. Owner Builds. Approx. $600,000. Co-operative APARTMENT for 84 families, Troy and Flatbush Aves., BROOKLYN, N. Y.

Hickory Terrace Homes, c/o John W. Burton, archt., 163-18 Jamaica Ave., Jamaica, N. Y. Owner Builds. $319,000. 30 one-family HOUSES, 78 Ave., 78 Rd., and 150 St., JAMAICA, N. Y.

▲ Hamilton Park Homes, c/o Alwin Cassens, Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds. Approx. $1,000,000. 100 HOUSES on 20-acre site, on Unqua St., MASSAPEQUA, N. Y.

Frank Mascali & Sons, 120 St. and 31 Ave., Flushing, N. Y. LB $728,240, street and yard imprvs.; LB $256,750, topsoil and planting for Edenwald Houses, Proj. NY 5-19 in area bounded generally by Laconia Ave., Grenada Pl., Baychester and Schieffelin Aves., E. 225 St., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., 63 Park Row, New York 38, N. Y. Bids May 27. CD 5/7.

▲ H. R. H. Constr. Co., 9 E. 40 St., New York 17, N. Y. LB $3,762,000 general constr.;

Harry Starkman & Bros., 348 Brook Ave., New York 54, N. Y. LB $465,000, heating and ventilating;

Brown Electric Co., 250 E. 43 St., New York 17, N. Y. LB $347,967, electrical work;

Far Plumbing Co., 2018 Crotona Parkway, New York 60, N. Y., LB $514,555, plumbing for Highbridge HOUSES, Proj. NY 5-26, in area bounded generally by Major Deegan Blvd. (Sedgwick Ave.) W. 167 St., University Ave. and line approx. 135 ft. north of W. 165 St., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., 63 Park Row, New York 38, N. Y. Bids June 4. CD 5/26.

Parkfield Homes, c/o Teas & Steinbrenner, archts., Homeland Bldg., Malverne, N. Y. Owner Builds. Approx. $500,000. 50 HOUSES, Boundary Ave. off Hicksville Rd., PLAINEDGE, N. Y.

▲ Forman Assoc., c/o John W. Burton, archt., 163-18 Jamaica Ave., Jamaica, N. Y. Owner Builds. $2,000,000. 218 HOUSES on tract at 240 St. and 147 Ave., ROSEDALE, N. Y.

▲ Costanza Contg. Co., 622 Pennsauken Ave., Woodlawn, N. J. LB $1,011,900, general constr. 1 story, brick Junior-Senior HIGH SCHOOL on 212-acre site on Old Lincoln Hy., Middletown Twp., LANGHORNE, PA. Lower Bucks County School Auth., Neshaminy High School, Langhorne, Pa. Bids June 6. CD 5/16.

▲ Turner Constr. Co., 420 Lexington Ave., New York 17, N. Y. CA. Approx. $3,000,000. 1 story cap MFG. BLDG., on 48-acre site, LEMOYNE, PA., American Can Co., 100 Park Ave., New York 17, N. Y. CD 6/6/51.

▲ General State Auth., 18 and Herr Sts., Harrisburg, Pa., rejected bids May 21, general constr., LB, $6,997,200; heating, LB, $959,860; plumbing, LB, $1,159,159; electrical, LB, $928,695; elevators, LB, $315,230, for constructing main HOSPITAL bldg. and utility tunnel and 2 DOCTORS' and NURSES' QUARTERS with connecting corridors to main hospital for Eastern Pennsylvania Psychiatric Institute, PHILA., PA. Will re-advertise. CD 5/26, under LB.

▲ Costanza Constr. Co., 225 E. Redwood St., Baltimore, Md. \CA $2,484,050. 1, 2 and 3 story, brick, concrete, steel Catonsville High SCHOOL, CATONSVILLE, MD., Baltimore Co. Bd. Educ., Aigburth Rd., Towson, Md. CD 5/8, under LB.

† Joseph F. Nebel Co., 2140 P St. N. W., Wash., D. C., CA $696,500. Fort Ritchie PROJECT, Auxiliary Site B. Eng. 19-080-52-90-(69), FORT RITCHIE, MD. U. S. Eng., First and Douglas Sts. N.W., Wash., D. C. Bids June 3, awarded June 5. CD 6/10, under LB.

† Southern Constr. Co., Inc., 1502 Massachusetts Ave. S.E. Wash., D. C., LB $475,885, 2 story bldg. and penthouse, exten. of exterior services, Bldg. 2 at Naval Research Laboratory, Bellevue, NOY 70525, Spec. 32114, WASH., D. C. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids June 5.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
June 24 West Virginia
STREETS AND ROADS
June 24, West Virginia — June 25, Louisiana
July 2, Florida

▲ Fla., Miami—TERMINAL—B.A. After 7/1—Dade County Port Auth., c/o Steward & Skinner, archts, 223 S.E. 1 St., terminal addn. at Miami International Airport $1,900,000. CD 4/26/50.

BIDS ASKED—BUILDINGS

Tenn., Nashville—SHOPPING CENTER—B.A. After 7/1—Charlotte Shopping Center, Inc., c/o Marr & Holman, archts., Stahlman Bldg., shopping center. $500,000.

Fla., Bartow—HOSPITAL ADDNS.—B.A. 7/8—Polk Co. Bartow, hospital addns. $500,000. Plans deposit $50. W. B. & Thomas V. Talley, P. O. Box 1104, Lakeland, archts. CD 7/26.

Ala., Troy—COURT HOUSE—B.A. 7/15—Pike Co., Troy, court house, $500,000. Plans deposit $50. Extended date. Welch, Kershaw & Crump, 230 S. Perry St., Montgomery, archts. CD 5/20.

SOON LETS CONTRACT—BUILDINGS

Ky., Louisville—FACTORY, etc.—Stratton & Terstegge Co., 104 N. 15 St., soon lets contract reinf.-con. factory and warehouse addn. $800,000. Former contract cancelled. Jos. H. Kolbrook, Starks Bldg., archt. E. R. Ronald & Assoc., 554 S. Third St., engrs. CD 8/23/51, under CA.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

NORTH CAROLINA—State Hy. & P. Wks. Comn., Raleigh,

J. C. Critcher, Inc., Technical Bldg., Asheville, N. C., CA, $520,704, est. $400,000-$500,000, traffic bound macad. bit. surf., tr., 7.34 mi. U. S. 23, Proj. 9630, F-275 (6), Macon and Jackson Counties. Bids May 27, awarded June 9. CD 6/2 under LB.

FLORIDA—State Rd. Dpt., Tallahasse,

Cleary Bros. Constr. Co., West Palm Beach, Fla., LB $825,392, bridge over Halifax River on Rd. 306 between Ormond and Ormond Beach, Job No. 7915-120, Volusia Co.;

Scott Constr. Co., Thomasville, Ga., LB, $278,171, 322 ft. bridge electrically operated single leaf bascule span and six 40 ft. I-beam spans, with concrete deck

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
B.A. Bids Asked
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

and steel pile bents on Road 30, Job 5911-103, Wakulla Co. Bids June 5. CD 5/7.

† **J. Hilbert Sapp,** West Palm Beach, Fla., LB $784,054, missile shops, interiors and misc. utilities at Patrick Air Force Base, Inv. 52-150, COCOA, FLA. U. S. Eng., P.O. Box 970, Jacksonville, Fla. Bids May 28. CD 5/8.

▲ **ALABAMA**—State Hy. Dpt., Montgomery,
W. C. Howton, 3904 10 Ave. N., Birmingham, Ala., CA, $1,103,800, Proposals B and C, Ensley Overpass, Proj. DG 316 (2), Jefferson Co. Bids May 16. CD 5/23, under LB.

▲ **LOUISIANA**—State Hy. Dpt., Highway Office Bldg., Baton Rouge,
Farnsworth & Chambers Co., Inc., 3018 Leeland St., Houston, Tex. CA $4,228,030. South Claiborne Ave. Overpass structure, b. conc. pavement approaches, etc., S. P. No. 46-01-02, F. A. Proj. No. U 200 (4), New Orleans. Bids May 7, awarded June 4. CD 5/14, under LB.

† **Anderson-Gibbs Corp.,** Box 2591, Houston, Tex. LB $769,915. Approx 2,150,000 cu. yd. hydraulic fill east Atchafalaya Basin Protection Levee, Terrebonne Parish, Inv. 52-229, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans 9, La. Bids June 4. CD 5/21.

▲ **James McHugh Constr. Co.,** 6449 S. South Park St., Chicago, Ill. and **S. A. Healy Co.,** 20 N. Wacker St., Chicago, Ill., CA $4,560,260, est. $6,000,000. river collectors, lift stations, treatment plant, NEWPORT, KY. Sanitation Dist. 1, Campbell and Kenton Counties, 37 E. 4 St., Newport, Ky. Bids May 20, awarded June 9. CD 5/26 under LB.

W. L. Hailey & Co., 314 42 Ave. N., Nashville, Tenn., CA $538,660, reinforcing mains, NASHVILLE, TENN. City, City Hall, Nashville, Tenn. Bids May 6. CD 5/20, under LB.

Modern Welding Co., E. 12 St. at Barnard, Owensboro, Ky. CA. Approx. $500,000. natural gas sys., TULLAHOMA, TENN. Tullahoma Natural Gas Co., Tullahoma, Tenn.

▲† **Pittsburgh-Des Moines Steel Co.,** Neville Island, Pittsburgh, Pa., LB $2,566,335, construct flexible steel nozzle for propulsion wind tunnel at Arnold Engineering Development Center, TULLAHOMA, TENN. U. S. Eng., Tullahoma, Tenn. CD 11/14/49, under Public Buildings.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Southeastern Constr. Co.,** Peoples Bldg., Charleston, W. Va., LB, $2,494,869, EXPERIMENT STATION, MORGANTOWN, W. VA. Bureau Mines, Dpt. Interior, Morgantown, W. Va. Bids May 27.

S. J. Curry & Co., Albany, Ga., LB, $607,000, HOSPITAL, CORDELE, GA. Crisp Co., Cordele, Ga. Bids May 30. CD 5/2.

C. R. Clark Co., 8975 N.E. 6 Ave., Miami, Fla., CA $550,000, HOTEL, CORAL CABLES, FLA. Siems Bros., 2516 Como Ave., Coral Gables, Fla.

▲ **Robert L. Turchin,** 1835 Purdy Ave., Miami Beach, Fla., LB, $1,000,000, 170-unit HOTEL, HALLANDALE, FLA. P & E Realty Corp. c/o Maurice S. Weintraub, archt., 235 Lincoln Rd., Miami Beach, Fla.

Starrett Bldg. Corp., 1646 Monroe St., Hollywood, Fla., Owner Builds, $500,000, 60 RESIDENCES, HOLLYWOOD, FLA.

Feldman Bldg. Corp., 605 Lincoln Road Bldg., Miami Beach, Fla., LB, $568,000, HOTEL, MIAMI, FLA. Biscayne Villas, Inc., c/o A. Herbert Mathes, archt., 605 Lincoln Road Bldg., Miami Beach, Fla. Bids June 2. CD 5/28.

Jack Rubin, 1209 N. W. 54 St., Miami, Fla., Owner Builds $400,000. RESIDENCES, MIAMI BEACH, FLA.

Paul Smith Constr. Co., P.O. Box 1912, Tampa, Fla., CA, $750,000, Mfg. PLANT, PLYMOUTH, FLA. American Can Co., 100 Park Ave., New York, N. Y. CD 9/25/51, under CA.

Lyons Constr. Co., Box 287, South Miami, Fla., Owner Builds, $400,000, RESIDENCES, SO. MIAMI, FLA.

Peyton Higgison Co., 59½ St. Francis St., Mobile, Ala., LB, $926,234, Trade SCHOOL, MOBILE, ALA. Alabama State Bd. Educ., 503 Dexter Ave., Montgomery, Ala. Bids June 3. CD 5/9.

Shelby Constr. Co., 1106 Canal St., New Orleans, La. LB $491,788. FACTORY for Johnston Lawn Mower Corp., BROOKHAVEN, MISS. City, Brookhaven, Miss. Bids May 31. CD 5/20.

Charles Carter & Co., Inc., P.O. Box 1270, Baton Rouge, La. CA $400,000. CHURCH, BATON ROUGE, LA. St. Anthony of Padua Church, 2417 Choctaw Dr., Baton Rouge, La. Bids June 5. CD 5/19.

▲ **The Lummus Co.,** Milam Bldg., Houston, Tex. LB $30,000,000. nitrogen fertilizer PLANT, LULING, LA. Lion Oil Co., J. B. Rogers, genl. mgr., El Dorado, Ark. CD 4/30.

McMichael Constr. Co., Box 508, Shreveport, La. LB $658,000, est. $550,000. 4 story, 20x60 ft. bsmnt., 143x161 ft., brick, Y.W.C.A. BLDG., SHREVEPORT, LA. Young Womens Christian Assn., 312 Edwards St., Shreveport, La. Bids June 4. CD 5/21.

O. L. Shobe Realty, Beulah Church Rd., Louisville, Ky. Own Forces. $630,000. 42 HOMES, Highview subdivision, 1.6 mi. southeast of new General Electric Plant Benchell, LOUISVILLE, KY. Awarded June 1.

▲† **J. A. Jones Constr. Co.,** 209 W. 4 St., Charlotte, N. C. CA Approx. $21,000,000 rehabilitation of Volunteer ORDNANCE WORKS, CHATTANOOGA, TENN. U. S. Eng., 303 Federal Office Bldg., Nashville, Tenn. CD 5/27.

Industrial Steel Erection Co., 2408 Vance Ave., Chattanooga, Tenn. CA. Approx. $500,000. PLANT addns. CHATTANOOGA, TENN. Combustion Engineering Superheater, Inc., W. Main St., Chattanooga, Tenn. CD 5/27.

▲ **Johnson & Willard Constr. Co.,** 422 W. Front St., Knoxville, Tenn., CA $1,205,000. SUPREME COURT, and OFFICE, KNOXVILLE, TENN. State of Tennessee, State Capitol Nashville Tenn. Bids June 5. CD 5/9.

▲ **Turner Constr. Co.,** Col. Mutual Tower Bldg., Memphis, Tenn., CA. Approx. $2,000,000. Boiler PLANT, MEMPHIS, TENN., Quaker Oats Co., 1526 Ragan Ave., Memphis, Tenn. Awarded June 6. CD 5/28.

† **Bowman Constr. Co.,** Oak Ridge, Tenn., LB $928,279. rehabilitation of 375 single family DWELLINGS, OAK RIDGE, TENN. U. S. Atomic Energy Comn., P.O. Box 3, Oak Ridge, Tenn. Bids June 5. CD 4/28.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

June 25 Michigan — July 1 Wisconsin

STREETS AND ROADS

June 25 Michigan — June 26 Indiana

July 1 Wisconsin

BIDS ASKED—BUILDINGS

Mich., Ludington—SCHOOL—B.A. 7/2—Bd. Educ. Ludington School Dist., 2 story, bsmnt., brick, concrete Junior High School. $750,000. Louis C. Kingscott & Assoc., 511 Monroe St., Kalamazoo, archts. CD 1/23.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

W. H. Heiby Co., Marietta, O., CA, Approx. $150,000. general contract drive in theater on Newport Pike, near MARIETTA, O. Durward Duty, c/o Washington Theater Co., Marietta, O.

Lewis Easlick Co., Sebewaing, Mich., CA, $283,806, est. $311,875. 20 mi. wid'n., deepening Monon Ditch, etc., near BUFFALO, IND. Dean Wicker Drainage Comr., Court House, Monticello, Ind. Awarded June 5.

▲ **ILLINOIS**—State Div. Hys., Springfield,
Collins Bruley Constr. Co., P. O. Box 228, Decatur, Ill., LB, $76,940, bit. 7.05 mi. FAS 549, Macon Co.; LB, $78,669, bit. 6.62 mi. FAS 548, Macon Co.;
Robert A. Black, Inc., 13192 S. Halsted St., Chicago 27, Ill., LB, $161,551, c. conc. base course wid'n. 10.08 mi. Marked U. S. 51, McLean Co.; LB, $224,434, c. conc. base wid'n. 13.91 mi. Marked U. S. 51, Marshall and La Salle Counties;
C. J. Moritz, Inc., Register Bldg., Effingham, Ill., LB, $142,549, bit. 19.1 mi. Ill. 160 and 130 Cumberland, Effingham and Edwards Counties; LB, $243,894, c. conc. base course wid'n. and c. conc. base course 6.24 mi. U. S. 45 Effingham Co.;
Bituminous Fuel & Oil Co., 304 Illinois Ave., East St. Louis, Ill., LB, $99,328, bit. with base strengthening 4.17 mi. FA 155, Madison Co.; LB $771,145, intermittent bit. seal coat on various roads Alexander, Franklin, Gallatin, Hardin, Jackson, Johnson, Massac, Pope, Pulaski, Randolph Union and Willamson Counties;
Trompeter Constr. Co., 2428 4 St., Peru, Ill., LB, $84,071, grav. or crushed stone surf. course 3.46 mi. FAS 271, La Salle Co.;
Arcole Midwest Corp., 3225 Main St., Evanston, Ill., LB, $779,280, c. conc. base course wid'n., conc. base course 22.04 mi. Marked U. S. 45, Effingham, Shelby and Cumberland and Coles Counties;
Mautz & Oren, Inc., 109½ Banker St., Effingham, Ill., LB, $239,940, c. conc. base course 1.1 mi. Marked U. S. 40 and 45, Douglas Co.;
General Paving Co., 30 E. John St., Champaign, Ill., LB, $139,831, bit. 3.68 mi. F.A.S. 669, Douglas Co.;
H. G. Goelitz Co., 5757 Ogden Ave., Cicero, Ill., LB, $183,119, bit. resurf. 3.01 mi. Archer Ave. and 95 St., Chicago, Cook Co.;
O'Dell and Riney Constr. Co., 310 S. Filmore St., Kirkwood 20, Mo., LB, $455,207, bit. resurf. 18.01 mi. U. S. 51, Christian and Shelby Counties;
Suburban Oil Co., 7340 W. 115 St., Forest Park, Ill., LB, $71,054, bit. 5.2 mi. FAS 37, Boone Co.;
Berenz & Son Asphalt Co., 500 E. Bell St., Bloomington, Ind., LB, $304,306, bit. resurf. 10.2 mi. Marked U. S. 51, McLean Co.;
E. A. Moreland Constr. Co., 422 Broadway, Peoria, Ill., LB, $110,895, bit. 3.41 mi. F.A.S. 562, Logan Co.;
W. J. Sheppard & Co., 1412 Altgeld St., Chicago 14, Ill., LB, $63,963, grav. or crushed stone surf. course 2.83 mi. FSS 174, La Salle Co.;
Hartong & Co., 11 S. La Grange Rd., La Grange Park, Ill., LB, $217,098, intermittent patching and bit. resurf. Ill. 64 and 83, Kane and Dupage Counties;
Giertz Melahn Asphalt Co., 57 Douglas Ave., Elgin, Ill., LB, $188,861, intermittent bit. patching and resurf. Marked U. S. 20 and Marked Ill. 64 and 126, Kane, De Kalb, Will and Kendall Counties;
W. L. Miller Constr. Co., Elvaston, Ill., LB, $189,894, bit. and base strengthening 14.33 mi. Ill. 96 and 155 Hancock Co.;
Mitchell Constr. Co., 216 E. Madison St., Herrin, Ill., LB, $287,777, c. conc. and grad. or crushed stone base wid'n. with bit. 1.78 mi. Marked Ill. 14, Franklin Co.;
Sterling Asphalt & Paving Co., 33 N. La Salle St., Chicago 2, Ill., LB, $325,704, bit. resurf. 12.33 mi. Marked U. S. 24, Ford and Iroquois Counties;
Jansen & Schaefer, 1500 Broadway, Pekin, Ill., LB, $177,726, c. conc. base course wid'n. 12.32 mi. Marked U. S. 4, Ford and Iroquois Counties;
Fred R. McKenzie & Co., 405 Bondi Bldg., Galesburg, Ill., LB, $158,823, grav. or crushed stone base surf. course 3.11 mi. F.A.S. 191, Whiteside Co.;
R. A. Cullinan & Son, Inc., Tremont, Ill., LB, $79,809 bit. 23.05 mi. Marked Ill. 87, Tabewell, Woodford and Marshall Counties;

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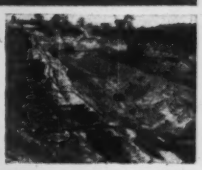
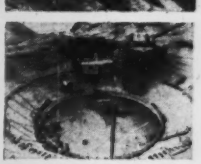
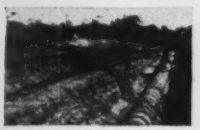


BUILDINGS



SEWERAGE

or any other type of wet work



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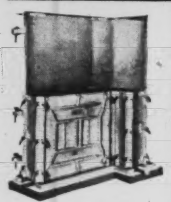

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Sankey Bros., Inc., 402 Illinois Bldg., Springfield, Ill. LB $135,225, bit. resurf. 3.97 mi. Marked U. S. 66 Sangamo Co.;

Johnston Roadbuilders, Inc., 15 4 Ave., Joliet, Ill., LB, $103,093, mi. bit. and base strengthening 18.06 mi. Marked Ill. 185, Montgomery and Fayette Counties;

Tallagher Asph. Co., Inc., 181 St. and Indiana Ave. Thornton, Ill., LB, $443,575, bit. resurf. 15 mi. Marked U .S. 51, Marshall and La Salle Counties;

J. C. Bremer, Hillsboro, Ill., LB, $78,745, bit. 8.76 mi. Marked Ill. 16, Macoupin and Montgomery Counties;

McCann & Co., Inc., 532 Reisch Bldg., Springfield, Ill., LB, $32,894, bit. resurf. 15.17 mi. F.A.S. 735 Macoupin Co.;

Howell Asphalt Co., National Bank Bldg., Mattoon, Ill., LB, $132,541, Coles and Douglas Counties;

S. J. Groves & Son Co., 505 N. MacArthur St., Springfield, Ill., LB, $351,922,
c. conc. base course w/d'n, concrete base course 17.83 mi. U. S. 51, Christian and Shelby Counties. Bids June 6. CD 5/28.

▲ **Kenny Constr. Co.**, 3220 Oakton St., Skokie, Ill., CA, $1,117,000, Congress St. Expressway drainage from Homan Ave. to Sacramento and from Sacramento to Pulaski Rd., CHICAGO, ILL. Cook Co. County Bldg. Chicago 2, Ill. Bids May 13, awarded June 4. CD 5/22, under LB.

Fitz Simons & Connell Dredge & Dock Co., 10 S. La Salle Stt., Chicago, Ill., LB, $348,318, shore protection work in Lincoln Park, CHICAGO, ILL. Chicago Park District, 425 E. 14 St., Chicago, 5, Ill. CD 6/12.

S. N. Nielsen Co., 3059 W. Augusta St., Chicago, Ill., CA, $805,213, sewage treatment plant;

Bahr Constr. Co., Manitowoc, CA, $180,104, sanitary sewers, ASHLAND, WIS. City, City Hall, Ashland, Wis. Bids May 22. CD 4/17;

Chapel & Amundson, 708 S. Broadway, Green Bay, Wis., LB, $111,283, storm sewers in East Side;

Lloyd Kisport, 628 Law St., Green Bay, Wis., LB, $61,613, storm sewer in West Side, GREEN BAY, WIS. City, City Hall, Green Bay, Wis. Bids May 26.

Tomaro Contractors, 5317 S. Lake Dr., Cudahy, Wis., LB, $112,917, sanitary sewers in various streets, GREENFIELD (Milwaukee P.O.), WIS. Town of Greenfield, 7325 W. Forest Home Ave., Milwaukee, 14, Wis. Bids June 5. CD 5/29.

Sachs & Kaufman, 724 Lafayette Bldg., Detroit, Mich. CA, $66,660. Group 52-10, concrete paving 2,504 ft. on part of southern city limits to Lonyo St.;

Julius Porath & Son Co., 702 Transportation Bldg., Dteroit, Mich. CA, $307,054, c. conc. 5,177 ft. Davison St., 1,580 ft. Braile St., DETROIT, MICH. City, Carl D. Warner, comr., Dpt. of Wks., Guardian Bldg., Detroit, Mich. Bids May 13. CD 5/2.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **William J. Mitchell Organization**, 22600 Cedar Point Rd., Cleveland 26, O., Owner Builds. $3,512,000, est. $3,500,000. 376 frame BUNGALOWS, Elsmere, Maplewood, Springdale and Midvale Aves., off Rocky River Dr. CLEVELAND, O.

▲ **Tibballs-Crumley-Musson**, 965 E. Broad St., Columbus, O. Owner Builds. $2,500,000. 157 bldgs (314 family units) in 2 and 4-family APARTMENTS in Woodcliff Development,, Broad St. and Hamilton Rd., COLUMBUS, O.

L. I. Combs & Son, 2645 Wabash St., Gary, Ind. Owner Builds $750,000, 75 HOMES various locations, near factories, GARY, IND. Awarded June 2.

ABC Constr. Co., 16 and Ritter Sts., Indianapolis, Ind. Owner Builds, $600,000, 49 homes in Hawthorne Manor, INDIANAPOLIS, IND. CD 4/10.

Robt. Regan Co., 25 N. Ottowa St., Joliet, Ill., LB $423,087, 1 story high SCHOOL, BEECHER, ILL. School District 200, Beecher, Ill. Bids May 29. CD 5/14.

John W. Harris & Assocs., 134 S. La Salle St., Chicago, 3, Ill., CA, $500,000, RESTAURANT with Greyhound Bus Terminal, CHICAGO, ILL. Toffenetti Restaurants, Inc., 225 S. Wabash St., Chicago, 3, Ill. CD 12/19.

▲ † **Corbetta Constr. Co.**, 208 S. La Salle St., Chicago, 3, Ill., CA, $2,694,500, Naval Supply DEPOT at Great Lakes Naval Training Center, GREAT LAKES, ILL. Ninth Naval Dist., Great Lakes, Ill. Bids May 9, awarded June 6. CD 5/28, under LB.

▲ **Butler Constr. Co.**, Minnesota Bldg., St. Paul, Minn., CA, $1,200,000, NOVITIATE, JOLIET, ILL. Franciscan Sisters of Sacred Heart, 372 Broadway, Joliet, Ill. Walter Butler Co., Minnesota Bldg., St. Paul, Minn., archts. Awarded May 26.

Detroit Steel Products Co., 2250 E. Grand Blvd., Detroit, Mich. CA, $550,159. furnishing, installing built-in steel electrical distr. conduits throughout the city-county bldg., DETROIT, MICH. City-County, Detroit-Wayne Joint Bldg. Auth., City Hall, Detroit, Mich. Bids June 3. CD 5/22.

Spence Bros., 417 McCoskry St., Saginaw, Mich. CA, $566,600. general contr., 2 story, bsmnt., brick, steel, 46,000 sq. ft. Gyles E. Merrill Elementary SCHOOL, Fleming Rd., FLINT, MICH. City, Bd. Educ., Flint, Mich. Bids May 20. CD 4/24.

▲ **Miller-Davis Co.**, 1029 Portage St., Kalamazoo, Mich. CA, $1,284,500 general contract, $479,900 mechanical contract, brick, steel, concrete tuberculosis HOSPITAL, KALAMAZOO, Mich. State, A. N. Langius, dir., State Bldg. Dpt., Lansing, Mich. CD 6/5, under LB.

Barton-Malow Co., 2631 Woodward St., Detroit, Mich. CA, $350,000. 2 story, brick, steel, concrete central station OFFICES, incl. dial equioment, WAYNE, MICH. Michigan Bell Telephone Co., Cass Ave., Detroit, Mich. Bids June 2. CD 6/2.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
June 27, Missouri, North Dakota
STREETS AND ROADS
June 27, Minnesota, Missouri, North Dakota

▲† **Okla., Altus**—DORMITORIES—B.A. 6/25—U. S. Eng., Box 61, Tulsa 2, 8 three-story 25,000 sq. ft concrete block, hollow tile, concrete frame; etc. dormitories, two 34,000 sq. ft. mess and admin. bldgs Inv. No. Eng 34-066-52-77. $2,000,000. Extended date, CD 5/19; rebuild fuel facility, $85,000; 2 bachelor officers quarters, $175,000; photographic laboratory $90,000, Hudgins, Thompson & Ball, 1100 W. Main St., Oklahoma City, engrs. for laboratory, all foregoing work at Altus Air Force Base. CD 1/24.

BIDS ASKED—BUILDINGS

▲ **Tex., Freeport**—SCHOOLS—B.A. 7/1—Brazosport Independent School Dist., Freeport, No. 1, Lanier Junior and No. 2, Elementary Schools, (Negro) $310,000; West Freeport Elementary School, $325,000; Elementary School 13, at Clute, $315,000; Elementary School Addn. No. 2 at Clute, $300,000; primary and elementary school at Jones Creek and Velasco Elementary Addn. at Velasco, $375,000; Lake Jackson Primary and Elementary; Junior-High addn. $375,000. Emory S. White, M & M Bldg., Houston, archt. Walter P. Moore, 2 Pinedale St., and Dale S. Cooper, 520 Sul Ross St., Houston, engrs. CD 12/4.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Johnson, Drake & Piper, Inc.**, 1138 Baker Bldg., Minneapolis, Minn., **Foley Bros., Inc.**, 900 New York Bldg., St. Paul, Minn., **C. F. Lytle Co.**, 250 Insurance Exchange Sioux City, Ia., **Donovan Constr. Co.**, 1725 Carroll St., St. Paul, Minn. and **Winston Bros. Co.**, Northwestern Bank Bldg., Minneapolis, Minn., CA, $13,297,580, spillway structure and gates for Garrison Dam and Reservoir Proj., Inv. 52-36, NORTH DAKOTA. U. S. Eng., Fort Lincoln, P. O. Box 300, Bismarck, N. D., Bids May 16. CD 5/29, under LB.

▲† **J. L. Shiely Co.**, 1101 Snelling Ave., St. Paul, Minn., LB $1,088,990, concrete aggregate for Garrison Dam and Reservoir Proj, Inc. 52-52. NORTH DAKOTA. U. S. Eng., Fort Lincoln, P. O. Box 300, Bismarck, N. D. Bids June 3. CD 5/7.

▲ **NORTH DAKOTA**—State Hy. Dpt., Bismarck.

Butler Constr. Co., 901 N. 6 St., Grand Forks, N. D. LB $223,108, b. conc. surf. and incid. 18.457 mi. S.H. 5 and U. S. 83, Mohall East and South Proj. No. F-40 (2) F-172 (3), F-288 (4) and F-303 (9), Bottineau and Renville Counties; LB $310,316, base, b. conc. surf. and incid. 15.722 mi. S.H. 1, Lawton north and south, Proj. F-225 (3) and F-294 (9), Ramsey Co.;

Anderson Constr. Co., Thief River Falls, Minn., LB $217,461, tr. serv. gravel and incid. 13.381 mi. S.H. 5, Fortuna west, Proj. F-79 (5) and F-361 (2), Divide Co.;

Wm Collins & Sons, Inc., 514 Black Bldg., Fargo, N. D., LB $209,635, tr. serv. grav. and incid. 17.977 mi. S.H. 27, Lisbon west, Proj. F-122 (2) and F-214 (2), LaMoure and Ransom Counties; LB $69,894, grav. surf. and stockpile 7.935 mi. U. S. 81 Fairmount South, Proj. SAP-4, Richland Co.;

H. B. Lien Constr. Co., Valley City, N. D., LB $270,083, tr. serv. grav., incid. 14.762 mi U. S. 81, Abercrombie, north and south, Proj. F-285 (8), Richland Co.;

Arnie Campbell, Inc., New Rockford, N. D., LB $299,130, tr. serv. grav. and incid 19.449 mi. S.H. 5, west of Cavalier, Proj. F-292 (5), Cavalier and Pembina Counties;

W. H. Noel Co., Jamestown, N. D., LB $221,598, tr. serv. grav. and incid 15.231 mi. S.H. 25 from Center east and south, Proj F-314 (11) and F-386 (5) Oliver Co.; LB $375,168, base b. conc. surf. and incid. 18.311 mi. S.H. 31, Hanover to New Salem, Proj. S-629 (2) Oliver and Morton Counties; LB $72,[illegible] bit. surf. and incid 0.405 mi. U. S. 83, southeast of Strasburg,Proj. SAP 663, Emmons Co.;

S. Birch & Sons Constr. Co., Ford Bldg., Great Falls, Mont., LB $339,148, base, b. conc. surf. and incid. 17.02 mi. U. S. 12, Marmath east and west, Proj F-379 (15), Bowman and Slope Counties. Bid. June 6. CD 5/23.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City, 5, Okla. rejected bids June 3, stabil base, double bit surf. 7.78 mi. Hy. 74, Custer Co. LB $221,659; stabil aggregate base and double bit. surf. 7 mi. No. 51, Logan Co. LB $430,801; stabil. aggregate base, double bit. surf. 2.12 mi. No. 51, Payne Co., LB $117,441; grading, drainage, incid. constr. 7 mi. No. 51 Marshall Co., LB $112,434; Bids of June 3 unopened account right of way trouble, grading, drainage, incid. constr. 5 mi. Hy. 74, Logan Co. est. $88,300; stabilized base, double bit. surf. 3.9 mi. Hy. 74, Logan Co., est. $117,000; grading, drainage, incid. constr. 4.99 mi. Hy. 74, Logan Co. est. $101,400; stabilized base, double bit. surf. 5 mi. Hy. 4, Logan Co. est. $303,500.

▲ **Oklahoma**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5;

Amis Constr. Co., 1647 Exchange St., Oklahoma City 8, Okla., CA $584,545, est. $583,626, c. conc. 7.804 mi. U. S. 75, near Coalgate, Coal Co.; CA $69,895, est. $63,300, stabil. double bit. surf 0.86 mi. Hy. 77 Cleveland Co.;

Austin Road Co., 1813 Clarence St., Dallas, Tex., CA $283,719, est. $281,770, stabil. aggregate base and double bit. surf 7 mi. No. 70, Tillman Co.;

Broce Constr. Co., Woodward, Okla., CA. **$154,667,** est. **$168,000,** stabil. aggregate base and double bit. surf. 6.06 mi. No. 283, Harper Co.;

Elliott Bros., Perry, Okla., CA. **$181,265,** est. $181,403, stabil. base and double bit. surf. 5.56 mi. No. 51, Kingfisher Co.;

W. D. Fulton Co., 1916 Broadway, Oklahoma City 6, Okla., CA $163,582, est. $164,088, grading, drainage, incid. constr. 7 mi. No. 70, Tillman Co.;

Homegar Bros., Kingfisher, Okla., CA. **$147,091,** est. $147,410, grading, drainage, incid. constr. 6.93 mi. Hy. 8, Alfalfa Co.;

Imperial Paving Co., 700 E. Grand St., Oklahoma City Okla., CA. **$126,056,** est. $128,000, resurf. 2.12 mi. U. S. 270, Oklahoma Co.;

Jones & Philips, El Reno, Okla., Ca. **$64,607,** est. $60,300, grading, drainage, incid. constr. 7.09 mi. Hy. 281, Major Co.;

Palleson Constr. Co., 3715 N. W. 23 St., Oklahoma City 7, Okla., CA. **$149,681,** est. $144,000, grading, drainage, incd. constr. 7.78 mi. Hy. 54, Custer Co.;

Park Ward Co., 711 N. W. 36 St., Oklahoma City 6, City 4, Okla., CA **$199,369** est. 200,127, stabil. double bit. surf. 7.09 mi. No. 281, Major Co.; Co.;

R. R. Ryan Constr. Co., 1401 N. W. 5 St., Oklahoma City 4, Okla., CA $199,369 est. 200,127, stabil. Base, double bit. surf. 6.93 mi. No. 8, Alfalpha;

Stebbins Constr. Co., Tri-State Bldg., Tulsa, Okla., CA **$123,975,** est. $110,370, grading, draining, incd. constr. 7.8 mi. No. 75, Coal Co., Grand total **$2,418,229.** Bids June 3, awarded June 5.

E. H. Reeder, 2128 Hawes St., Dallas, Tex., CA. **$698,313.** 48 in. water main from Singleton to Westmoreland and to Sunset reservoir in Oak Cliff, DALLAS, TEX. City, City Hall, Main and Harwood Sts., Dallas, Tex. Bids June 3. CD 6/11 under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

S. Patti Constr. Co., Inc., 1340 Admiral St., Kansas City, Mo. CA **$749,098.** Elementary SCHOOL, OVERLAND PARK, KAN. Consolidated School Dist. 10, Overland Park, Kan. Kivett & Myers, 1016 Baltimore St., Kansas City, Mo., archts. Bids May 23. CD 1/23.

Builders Constr. Co., McGee Bldg., Oklahoma City, Okla., CA. Approx. $675,000. 1 story HIGH SCHOOL, NORMAN, OKLA. Bd. Educ., Norman, Okla., Bids May 28. CD 5/7.

Walter E. Wirtz, P.O. Box 906, Amarillo, Tex., CA **$687,703,** est. $650,000. Y.M.C.A. BLDG., AMARILLO, TEX. Young Mens Christian Assn., Amarillo, Tex., Bids May 20. CD 5/28, under LB.

Jansen Constr. Co., 1203 Powhattan St., Dallas, Tex., CA. $545,000. 1 and 2 story masonry, steel MFG., ENGINEERING and LABORATORY bldg., 600 Lemmon Ave., DALLAS, TEX. Texas Instruments, Inc., c/o Smith & Mills, archts., Mercantile Security Bldg., Dallas, Tex.

T. C. Bateson Constr. Co., 618 Irwin-Keasler Bldg., Dallas, Tex., CA $567,682. No. 1, Oleander HOMES, low cost housing, superstructures for 95 apartments in 14 masonry type bldgs., GALVESTON, TEX. Galveston Housing Auth., City Hall, Galveston, Tex. Bids May 29, awarded June 10. CD 6/9, under LB.

J. S. Norman Building Corp., c/o J. S. Norman, 4515 Richmond Rd., Houston, Tex., Owner Builds. $568,000. Job. No. 5, 40 DWELLINGS, HOUSTON, TEX. CD 1/24.

▲ **Stearns-Roger Mfg. Co.,** 1720 California St., Denver, Colo., CA. Approx. $1,200,000. gas compressor PLANT, PICKTON, TEX. Humble Oil & Refining Co., Humble Bldg., Houston, Tex. CD 6/5.

Frank Robertson, Majestic Bldg., San Antonio, Tex. Purchase and Hire, Approx. $435,000. Proj. No. 5, 50 DWELLINGS, SAN ANTONIO, TEX. CD 12/27.

Hightower & Lubrecht, Missoula, Mont. CA **$455,100.** general contract, 2 story, 164x201 ft., rein.-con., brick, steel Women's CENTER BLDG., MISSOULA, MONT. Montana State University, Missoula, Mont. Gehres D. Weed, 727 14 St. E., Kalispell, Mont., archt. Awarded June 3. CD 9/15/45.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
July 2, 3, California
STREETS AND ROADS
July 2, California

▲ **Calif., Hayward**—B.A. 7/7—City, City Hall, sewage disposal plant, appurtenant work, lines, etc. $1,700,000. Plans deposit $50. Harry N. Jenks, 63 Crescent Dr., Palo Alto, engr. CD 4/17.

▲† **Calif., El Toro**—HANGAR—B.A. 7/8—Dpt. Navy, San Diego, aircraft maintenance hangar (first increment) Tactical Area III at Marine Corp Air Station, $1,000,000. Plans deposit $160. CD 5/23.

† **Calif., El Toro**—ELECTRICAL DISTRIBUTION SYSTEM—B.A. 7/15—Dpt. Navy, San Diego, electrical distr. sys. (second increment) at Marine Corps Air Station NOY 27540, Spec. 33733. $500,000. Plans deposit $60. CD 5/23.

BIDS ASKED—BUILDINGS

▲ **Calif., Fresno**—ASSEMBLY—B.A. 6/26—Fresno City Unified School Dist., 2348 Mariposa St., assembly and allied arts bldg. at Roosevelt High School, $1,000,000. Plans deposit $75. H. Rafael Lake & Elso D. Di Luck, Patterson Bldg., archts. CD 5/2/51.

Calif., Los Angeles—CANCER RESEARCH—B.A. 6/26—University of California, 4-5 Hilgard Ave., West Los Angeles, 4 story, rein.-con. cancer research bldg. $700,000. Plans deposit $150. Welton Beckett & Assoc., 5657 Wilshire Blvd., Los Angeles, archts. CD 1/5/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OREGON**—State Hy. Comn., Highway Bldg., Salem,
Lindstrom Bros., 7335 N.E. Broadway, Portland, Ore., CA. **$133,065,** paving county road, FAP S-121 (1), Clackamas Co.;
White Bros. Co., Walla Walla, Wash., CA. **$1,158,818,** grading, paving 5.7 mi., 2,000 cu. yd. crushed materials, Pacific Hy. west, FAP BFI-189 (11), Douglas Co.;
Warren Northwest, Inc., 9860 N.E. Hancock St., Portland, Ore., CA. **$269,661.** paving 7.44 mi. Columbia River Hy. FAP BFI-174 (17) and BFI-35 (8), Hood River and Wasco Counties;
H. J. & H. W. Miller, Baker, Ore., CA. **$177,356,** grading, paving 1.05 mi., rein.-con. bridge, Wallowa Lake Hy., Wallowa Co.;
Edwin C. Garber, Oregon City, Ore., CA. **$91,498,** grading 0.42 mi., surf. 5.09 mi., Shaniko County Road, FAP S-120 (1), Wasco Co.;
Fred H. Slate Co. and E. C. Hall, 12012 S.W. Barbur St., Portland, Ore., CA **$288,087,** grading, paving 3.84 mi., 2 concrete bridges, FAP S-216 (3), Douglas Co.;
Peter Kiewit & Sons Co., Box 491, Longview, Wash., CA **$681,309,** grading, oiling 18.16 mi., one bridge and 4 box culverts, Klamath Lake Hy. FAP S-60 (1) and S-60 (2), Klamath Co.; CA **$531,622,** paving 1.99 mi. Columbia River Hy. FAP BF-135 (5), Clatsop Co. Grand total $3,271,416. Bids May 26.

▲ **OREGON**—State Hy. Comn., Highway Bldg., Salem,
McNutt Bros., Eugene, Ore., CA. **$963,787,** grading, paving 5.21 mi., 5 concrete bridges, Corvallis-Newport Hy. FAP BF-150 (4), Lincoln Co.;
Jack R. Taggart, Salem, Ore., CA. **$234,253,** grading, surf. 7.56 mi. Orleans-Lebanon Hy., FAP S-119 (1), Linn Co.;
J. C. Compton Co., McMinnville, Ore., CA. **$250,535.** grading, paving 2.2 mi. Pacific Hy. west, FAP BFZ-179 (7) and BF-122 (8), Yamhill Co.;
Rogers Constr. Co., 11760 N.E. Glisan St., Portland, Ore. CA. **$326,014,** grading 6.74 mi. Columbia River Hy., FAP FI-145 (7), Gilliam Co.;
C. R. O'Neil, Mitchell, Ore., CA. **$97,447,** grading, surf. 3.95 mi. O'Neil Hy. FAP S-63 (2), Crook Co. Grand total $1,872,036. Bids May 27.

▲ **CALIFORNIA**—State Div. Hys., Los Angeles, R. M. Price, 2285 Pinecrest Dr., Altadema, Calif., CA **$1,206,625,** 7 rein.-con. bridges wid'n. streets Ramona Freeway in Pomona and Claremont, Los Angeles Co. Bids May 22, awarded June 5. CD 6/2, under LB.

CALIFORNIA—State Div. Hys., Sacramento,
Eaton & Smith, 1215 Michigan Ave., San Francisco, Calif., CA, **$516,184** rein.-con. arch culvert and 0.45 mi. grading, etc. at Rattlesnake Creek, Mendocino Co. Bids May 21, awarded June 5. CD 5/27, under LB.

▲† **Stolte, Inc. and Gallagher & Burke, Inc.,** 8451 San Leandro St., Oakland, Calif., LB **$1,058,500,** Item 1; $968,500, Item 2; **$1,025,000,** Item 3; $1,047,500, Item 4; $1,056,300 Item 5; water, sewer gas lines, etc., grading, paving at Supply Depot area, NOY 72362, Spec. 32779; LB, **$461,744,** turbo-prop engineering test cells, U. S. Naval Air Station, NOY 29828, Spec. 31516, ALAMEDA, CALIF. Twelfth Naval Dist., San Bruno, Calif. Bids June 6. CD 5/15.

BUILDINGS

LOW BIDS AND CONTRACTS

J. H. Colby, 11246 12 Ave., S.W., Seattle, Wash., Day Labor $400,000, 40 HOUSES between 6 and 8 Ave. S.W. south of S.W. 146 St., BURIEN, WASH. CD 5/29.

Henry George & Sons, Hutton Bldg., Spokane, Wash. CA $982,313. general contract MINIMUM-SECURITY BLDG., state penitentiary, WALLA WALLA, WASH. State, Dpt. P. Institutions, Olympia, Wash. CD 6/4, under LB.

▲ **C. L. Peck,** 516 W. 5 St., Los Angeles, Calif., CA, Approx. $2,000,000 9 story OFFICE, Wilshire Blvd. and Grand Ave. LOS ANGELES, CALIF. Standard Federal Savings & Loan Assoc., 735 S. Olive St., Los Angeles, Calif. Welton Becket & Assoc., 5657 Wilshire Blvd., Los Angeles, Calif., archts. Awarded June 2.

▲ **J. E. Burrell & Sons,** 52 San Francisco Ave., Long Beach, Calif., LB, **$1,067,750,** general contract;
John W. Ward, 5881 Cherry Ave., Long Beach, Calif., LB **$323,636,** mechanical work combined, Southern California RECEPTION CENTER, CLINIC INSTITUTION BLDGS. for Calif. Youth Auth., NORWALK, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids June 5. CD 5/22.

▲ **Lawrence & Continental,** 3020 V St., Sacramento, Calif., **$1,013,013** general contract, Northern California RECEPTION CENTER and CLINIC INSTITUTION BLDGS. for Calif. Youth Auth., SACRAMENTO, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids May 13, awarded June 6. CD 5/22, under LB.

Lew Jones Constr. Co., 1534 S. 10 St., San Jose, Calif., LB, **$747,000,** general contract SPEECH and DRAMA BLDG. for San Jose State College, SAN JOSE, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids June 5. CD 5/13.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Johnson Constr. & Maintenance Co.,** Anchorage, Alaska, LB **$352,147,** est. $405,900, water supply and distr. sys. with well, underground reservoir, etc. Proj. Aaa, 50-A-127, PALMER, ALASKA. Alaska P. Wks., Dpt. Interior, Juneau, Alaska. Bids June 4. CD 4/30.

Alaska P. Wks., Dpt. Interior, Juneau, Alaska, rejected bids May 21, water sys., WRANGELL, ALASKA. LB **$322,440.** CD 5/28, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 13, Ontario

BIDS ASKED—BUILDINGS

Que., Mount Royal—SCHOOL—B.A. 6/27—Protestant School Comrs., J. Thredgold, secy., Montreal, 1 story, rein-con., brick Algonquin School library, offices, etc., Mitchell St. $485,000, Lawson & Betts, 660 St. Catherine St. W., Montreal, archts.

Ont., Toronto—SCHOOLS—B.A. 6/30—Page & Steele, archts., 72 St., Clair Ave. W., two schools one on Anthony Rd. and other on Baycrest Ave., in North York Twp., for First Twp. School Area of North York, Toronto, Ont. Approx. $450,000. Plans deposit $50. each. R. C. Manning, 55 De Vere Gardens, engr. CD 12/15/43.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

ALBERTA—Dpt. Hys., Parliament Bldgs., Edmonton,
Mannix-O'Sullivan Paving Co., 332 Seventh Ave. W., Calgary, Alt., CA, **$684,659,** stabilized gravel base hy. 26 mi. between Camrose and Daysland. Awarded June 4. CD 12/1/43.

▲ **ALBERTA**—Province of Alberta, Parliament Bldgs., Edmonton,
Continental Constr. Co. Ltd., and Evans Constr. Co. Ltd., Lethbridge, Alta., CA, $718,700, grading, other work Hy. 1 from Dunmore to Walsh;
Mannix Ltd., 332 7 Ave. West, Calgary, Alta., Ca $384,200, grading, other work, Hy. 1 from Calgary to Chestermere Lake;
Standard Gravel & Surfacing of Canada Ltd., 5340 1 St. Southwest, Calgary, Alta., CA, **$254,242,** grading, other work Hy. 13 between Daysland and Killam;
Bothwell Bros., Calgary, Alta., CA, **$162,480,** grading, other work Hy. 21 from north of Ferintosh to Ervick;
New West Constr. Co. Ltd., 10480 113 St. Edmonton, Alta., CA, $288,850, grade wid'n., other work on Hy. 16 from Innisfree to Stone Creek. Grand Total $1,808,492. Awarded June 5. CD 12/3/43.

Commonwealth Constr. Co. Ltd., 700 Taylor St., Vancouver, B. C., CA, $479,127, asph. paving streets, concrete sidewalks, curbs, gutters in Fraserview Housing, VANCOUVER, B. C. Central Mortgage & Housing Corp., 360 Homer St., Vancouver, B. C. Bids May 20, awarded June 6. CD 5/1.

Consolidated Dredging Ltd., 54 Chestnut Pk, Toronto, Ont, CA, **$465,341,** dredging in harbour, PORT ARTHUR, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids May 14. CD 5/1.

BUILDINGS

LOW BIDS AND CONTRACTS

Arvo Tuomi, 278 North Algoma St., Port Arthur, Ont., CA, **$600,000** 70 unit HOUSING, FORT ARTHUR, ONT. Central Mortgage & Housing Corp., 400 Kensington Bldg., Winnipeg, Man. Bids May 6, awarded June 6. CD 4/24.

John Hayman & Sons, Ltd., 432 Wellington St., London, Ont. CA, **$900,000,** two addns. one 6 story, 45x143 ft. and other 4 story, 55x103 ft. St. Joseph's HOSPITAL ADDNS., LONDON, ONT. Sisters of St. Joseph, London, Ont. John M. Watt, 343 Richmond St., London, Ont., archt. Awarded June 6.

Morasutti & Bratty, 11 Newgate Rd., Toronto, Ont., Owner Builds, **$600,000,** 6 story APARTMENT block, incl. 62 suites, Briar Hill Ave. and Bathurst St., TORONTO, ONT. J. E. Hoare, Jr., 481 Eglinton Ave. W., Toronto, Ont., archts.

D'Amours & Brother Ltd., 2633 Bourbonnier Ave., Montreal, Que., CA, **$510,000,** 72x200 ft. and 55x100 ft., rein.-con., steel, brick SCHOOL for Parish of St. Kevin, Dupuis Ave., MONTREAL, QUE. Catholic School Comn., 117 W. Ste. Catherine St., Montreal, Que. Bids June 3. CD 6/11, under LB.

AMERICANS ABROAD

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **M. W. Kellogg Co. & Costain-John Brown, Ltd.,** 225 Broadway, New York 7, N. Y. CA **$90,000,000.** 3 million tons per annum REFINERY on Cockburn Sound near Fremantle, KWINANA, AUSTRALIA. Anglo-Iranian Oil Co., Britannic House, Finsbury Circus, London, England.

(Proposal Advertisements see pp. 129 to 132)

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† Mass., Hingham—DISTRIBUTION SYSTEM—B.A. 6/25—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston, repairing underground steam distr. sys., Naval Industrial Reserve Shipyard, NOY 70877, Spec. 31286.

† R. I., Davisville—B.A. 6/25—P. Wks. Office, Fifth Naval Dist., 495 Summer St., Boston, Mass., seal coating roads and stabilization of storage areas at U. S. Naval Advanced Base Depot, NOY 73759, Spec. 34814. Plans deposit $10.

† Mass., Charlestown—ELECTRIC UTILITY SERVICE—B.A. 6/26—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston, electric utility service, Dry Docks 1 and 2 and Piers 1—10 (inclusive) at Boston Naval Shipyard, Boston, NOY 72016, Spec. 32472. Plans deposit $15. CD 11/2/51.

Mass., Hingham—B.A. 6/26—Dist. P. Wks. Office, First Naval Dist., 415 Summer St., Boston, exten. sewerage sys., U. S. Naval Ammunition Depot, NOY 73758, Spec. 34813.

BIDS ASKED—BUILDINGS

Mass., Worcester—CLUB HOUSE—B.A. 6/25—At office L. C. Roy & Daland Chandler, archts., 9 Arlington St., Boston, club house, Providence and Winthrop Sts., for Worcester Girls Club, 67 Lincoln St., Worcester, Mass., $500,000. Kilham, Hopkins, Greeley & Brodie, 9 Arlington St., Boston, assoc. archts. CD 12/14/51.

Conn., East Hartford—SCHOOL—B.A. 6/26—Town Town Hall, High School Burnside Ave. Plans deposit $100. Extended date. CD 5/15.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MASSACHUSETTS—Commonwealth of Mass., Metropolitan Dist. Comm., Parks Div., 20 Somerset St., Boston,

C. J. Maney Co., Inc., 1 Dame St. Somerville, Mass., LB $586,221, Alternate A $603,941, est. $700,000. Contr. 742 viaduct and roads, Jas. J. Storrow Memorial Drive, Charles River Reservation, Boston. Bids June 5. CD 5/23.

Wes-Juliau Constr. Corp., 850 Providence Hy., Dedham, LB $591,537, est. $600,000. Constr. 152, Wellesley extension relief sewer, Needham, Dover, BOSTON MASS. State Metropolitan Dist. Comn., 20 Somerset St., Boston, Mass. Bids June 5. CD 5/26.

Wes-Julian Constr. Corp., 850 Providence Hy., Dedham, Mass., LB, $157,700, est. $160,000. Contr. 186, furnish, place cement mortar protective coating on steel water pipe, Medford, BOSTON, MASS. Commonwealth of Mass., Metropolitan Dist. Comn., Water Div., 20 Somerset St., Boston, Mass. Bids June 5. CD 5/23.

Elm Constr. Co., 15 Elm St., Hyde Park, Mass., LB, $152,018, sewers, DEDHAM, MASS. Town Bd. Selectmen, Memorial Hall, Dedham, Mass. Bids May 29. CD 5/7.

BUILDINGS

LOW BIDS AND CONTRACTS

Charles Logue Building Co., 331 Newbury St., Boston, Mass., CA, $300,000. GYMNASIUM, BRIGHTON, MASS. St. Elizabeth's Hospital, 736 Cambridge St., Brighton, Mass. CD 4/1.

Waterbury Constr. Co., 63 Bank St., Waterbury, Conn., LB, $718,000, MP, 43-moderate rental HOUSING next to Lewis Meadows, NAUGATUCK, CONN. Borough of Naugatuck Housing Auth., 270 Church St., Naugatuck, Conn. CD 5/19.

Lorella & Naccarato, 21 Avery St., Mystic, Conn., CA, $536,000, SCHOOL, Clark Lane, WATERFORD, CONN. Town School Bldg. Comn., Waterford, Conn. Bids May 22, awarded June 3. CD 5/29, under LB.

▲ The Edward Packtor Co., 462 Silas Deane Hy., Weathersfield, Conn., CA, $1,402,721, HIGH SCHOOL Walcott Hill Rd., WETHERSFIELD, CONN. Town School Bldg., Comn., Wethersfield, Conn. Bids May 20, awarded June 3. CD 5/28, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

† N. J., Fort Monmouth—BULKHEAD—B.A. 6/24—U. S. Eng., 80 Lafayette St., New York 13, N. Y., reconstruct Parker's Creek Bulkhead, Eng. No. 30-075-52-726, $270,000. Plans deposit $5.

New Jersey—B.A. 6/26—R. J. Abbott, comr. Hy. Dpt. State Hy. Office Bldg., 1035 Parkway Ave., Trenton, traffic control 0.802 mi. Route 25 Section 300 Passaic River Bridge and Approaches, in City of Newark and Town of Kearny, Essex and Hudson Counties. Plans deposit $10; add. ENR, 6/19.

† N. Y., Cortland—B.A. 6/26—Fish & Wildlife Service, Dist. Interior, 59 Temple Pl., Boston 11, Mass., construct macad. road at U. S. Fish Cultural Station, Inv. No. FW 5-1837.

Pennsylvania—ELECTRICAL DISTRIBUTION SYS.—B.A. 7/9—Dpt. Property & Supplies, 319 N. Front St., Harrisburg, electrical distr. sys. at Raccoon Creek State Park, Beaver Co. Plans deposit $10. Extended date. CD 5/22.

BIDS ASKED—BUILDINGS

† Pa., Chambersburg — WAREHOUSES — B.A. 6/25 — U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore 3, MD. G.S.A. Warehouses 1 and 2, Letterkenny Ordnance Depot, approx 5 mi. north of here, Serial No. ENG 18-020-52-54. CD 6/3.

† Md., Fort Ritchie—PROJECT—B.A. 7/8—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C, Fort Ritchie Project Auxiliary Site A, Eng 49-080-52-99-1747.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ PENNSYLVANIA—State Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,

Poirier & McLane Corp., 33 W. 42 St., New York, N. Y., LB $3,566,618, est. $3,000,000. Schedule 1, substructure, 3 span deck I-beam bridge, 2 single span I-beam bridges, 5-span plate girder and I-beam bridge and 9-span concrete arch and I-beam bridge, Schedule 2, superstructure constr. of same bridges, Schedule 3, combined. Bids June 6. CD 5/19.

▲ PENNSYLVANIA—State Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,

F. D. Kessler, Inc., Northumberland, Pa., LB $1,636,891, construct 24,009 ft. divided highway of rein.-con. 24 ft. wide on each side of divisor, 2 plate girder and one I-beam bridge, sect. of Allentown-By-Pass Rte. 22, Lehigh and Northampton Counties. Bids June 6. CD 5/19.

▲ PENNSYLVANIA—State Hy. Dpt., 506 North Office Bldg., Harrisburg,

Putnam & Greene, Inc., P. O. Box 2012, Fort Wayne 3, Ind., LB $1,046,322, wid'n 71,717 ft. road with crushed aggregate base and bit. surf. new and existing base, T. R. 36, Clearfield Co.; LB $225,390, 16,808 ft. crushed aggregate base with bit. surf. 20 ft. wide and wid'n. T. R. 26, Huntingdon Co.;

C. F. Goeringer Constr. Co., Inc., 73-75 E. Market St., Wilkes-Barre, Pa., LB $989,717, 9,545 ft. crushed aggregate base with bit. surf. 50 ft. wide and wid'n. T. R. 11, Luzerne Co.;

B. B. Constr. Co., Phillipsburg, Pa., LB $264,508, construct 6,167 ft. crushed aggregate base with bit. surf. and wid'n. T. R. 53, 550, Centre Co. Bids June 6. CD 5/21.

Washington Eng. & Constr. Co., Oakland and Penna. Ave., Washington, Pa., CA. Approx. $151,541, 3 story, 30x25 ft. brick, block filtration plant, CHARLEROI, PA. Charleroi Boro Auth., Charleroi, Pa. Bids Apr. 29. CD 5/9, under LB.

Allied Contractors, Inc., 204 E. Preston St., Baltimore, Md., LB $345,539. Eldersburg-Louisville Bridge over Morgan Run, 930 lin. ft. steel piles, 1,215 lin. ft. steel railing, part of Patapsco River Development, BALTIMORE, MD. City Bureau Water Supply, Municipal Bldg., Baltimore, Md. Bids June 4. CD 5/26.

Mahoney Bros., Knickerbocker Bldg., Baltimore, Md., LB $112,989. Contr. 1181 sheet asph. resurf., BALTIMORE, MD. City, Bureau Hys., 303 Municipal Bldg., Baltimore, Md. Bids June 4. CD 6/29.

† Smith Bros., Gaithsville, Md., LB $60,720, dredging boathouse basin to provide depth of water 10 ft. in channel and 6 ft. along existing sheet pile bulkhead, steel sheet pile bulkhead approx. 550 ft. long, Naval Ordnance Laboratory Test Facility, NOY 71681, Spec. 33084, SOLOMONS, MD. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids June 3. CD 5/21.

Corson & Gruman Co., 33 and K Sts. N.W., Wash., D. C., LB $139,666, c. conc. curb and gutter and laying b. conc. surf. at various locations, WASH., D. C. Dist. of Columbia, Director of Highways, District Bldg., 14 and Pa. Ave. N.W., Wash., D. C. Bids June 3.

Donaldson Paving Co., Inc., 20 Potomac Ave. S.W., Wash., D. C., LB $362,587, repairing asph. pavements and concrete bases at various locations;

Circle Paving Co., 657 A St. S.E., Wash., D. C., LB $129,555 repair c. conc. roadways, alley pavements and sidewalks various locations, WASH., D. C. Director of Highways Dist. of Columbia, District Bldg., Wash., D. C. Bids June 2. CD 5/26.

BUILDINGS

LOW BIDS AND CONTRACTS

Caristo Constr. Corp., 26 Court St., Brooklyn 2, N. Y., CA. Approx. $500,000. SCHOOL, BROOKLYN, N. Y. St. Bernadette Church, 13 St., Brooklyn, N. Y., Henry V. Murphy, 1 Hanson Pl., Brooklyn 19, N. Y., archt.

† H. Platt Co., 1104 Sellinger Ave., Erie, Pa., LB $183,654, 1 story, 180x240 ft. and 1 story, 80x100 ft. frame machine and maintenance SHOP, ERIE, PA. Fourth Naval Dist., U. S. Naval Base, Phila., Pa. Joseph G. Conrath, 439 E. 6 St., Erie, Pa., engr.

Washington Eng. & Constr. Co., Oakland and Penna. Aves., Washington, Pa., CA. Approx. $406,956, 2 story, bsmnt., 43x123 ft., brick, block HOSPITAL addns., alterations, FRANKLIN, PA. Franklin Hospital, Franklin, Pa. CD 4/5/51.

Navarro Co., 400 Broad St., Pittsburgh, Pa., CA. Approx. $200,000. 1 story, 92x110 ft., brick, block STORAGE GARAGE, PITTSBURGH, PA. Yellow Cab Co., 1st and Ross Sts., Pittsburgh, Pa., E. J. Hergenroeder, 800 Century Bldg., Pittsburgh, Pa., archt.

▲ Westinghouse Electric Co., Maloney Bldg., Pittsburgh, Pa., Separate Contracts. $9,000,000. 1 story 210x1,000 ft. brick TRANSFORMER PLANT addn., steel deck roof constr. SHARON, PA. J. Gordon Turnbull, Inc., 2630 Chester St. N. E., Cleveland, O., archt. CD 1/24.

† Joseph F. Nebel Co., 2140 P. St. N. W., Wash., D. C., LB $696,500. Fort Ritchie PROJECT Auxiliary Site B, Eng. 49-080-52-90-(69), FORT RITCHIE, MD. U. S. Eng., First and Douglas Sts. N. W., Wash., D. C. Bids June 3. CD 5/9.

Joseph F. Nebel Co., 2140 P St. N. W., Wash., D. C., CA $318,700, 3 story, bsmnt. BANK, S. Capitol St. WASH., D. C. Anacostia National Bank, 2000 Nichols Ave. S. E., Wash., D. C. Bids June 3, awarded June 5. CD 6/3.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† Va., Chincoteague—B.A. 6/24—P. Wks. Office, Headquarters Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, water and sewerage systems at U. S. Naval Aviation Ordnance Test Station, NOY 73620. Spec. 34691. Plans deposit $10.

† Fla., Green Cove Springs—ELECTRICAL SYSTEM—B.A. 6/25—Dpt. Navy, Officer in Charge of Construction, Box 365, Naval Base, S. C., electrical system alterations at U. S. Naval Station, NOY 72935. Plans deposit $10.

† Fla., Jacksonville—B.A. 6/25—Dpt. Navy, Officer in Charge of Construction, Box 365, Naval Base, S. C., paving roads and parking area at Naval Reserve training center, NOY 74155. Extended date. CD 5/14.

† W. Va., Huntington—B.A. On or About 7/2—U. S. Eng., 237 Fourth Ave., Zone 18, bridges over Fourpole Creek, Serial No. CIVENG 46-022-52-88.

† Fla., Key West—PARKING APRON, etc.—B.A. 7/9—Dpt. Navy, Officer in Charge of Construction, Box 465, Naval Base, S. C., plane parking apron, L.T.A. Mooring facilities, taxiways and taxiway lighting system at Naval Air Station, Boca Chica Field, NOY 71516. Plans deposit $30. CD 11/30.

† Fla., Sanford—RUNWAY, etc.—B.A. 7/10—Dpt. Navy, Officer in Charge of Construction, Box 465, Naval Base, S. C., runway, taxiway, parking apron at Naval Auxiliary Air Station, NOY 71525. Plans deposit $50.

BIDS ASKED—BUILDINGS

† Ky., Fort Knox—HOSPITAL—B.A. 6/26—U. S. Eng., 830 W. Broadway, Louisville, Zone 3, altering cantonment hospital, incl. obstetrica. ward, pre-natal clinic, mess hall addn., admin. bldg., R and D Office, Eng. 15-029-52-58. CD 6/6.

Tenn., Memphis—HOSPITAL—B.A. 6/26—Methodist Hospital, 1265 Union Ave., addn. of 5th floor on present hospital bldg. $300,000. Walk C. Jones & Walk C. Jones, Jr., 1215 Poplar St., archts. CD 4/16.

† Fla., Key West—SCHOOL—B.A. 7/8—Dpt. Navy, Officer in Charge of Construction, Box 465, Naval Base, S. C., U. S. Fleet Sonar School at Naval Station, NOY 70699. Plans deposit $60.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Payne & Oliver Co., Baileys Cross Roads, Va., CA $199,392, install 30,409 lin. ft. 8 to 10 in. pipe, Sanitary Dist. 1, Contr. 12, FAIRFAX, VA. Bd. Supervs. Fairfax Co., V.E.P.C.D. Bldg., Fairfax, Va. Awarded June 4.

† Victor Beauchamo, Inc., 6837 4th St. N. W. Wash. D. C. LB $384,840, 3 water filtration plants at Marine Corps Schools, NOY 28059, Spec. 29740, QUANTICO VA. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids June 4. CD 5/16.

† Conn Structors, Inc., 209-212 Whitehead Bldg., Atlanta, Ga., LB $81,600, construct auto maintenance shop bldg. at Charleston Airfield, No. 38-081-52-66, CHARLESTON, S. C. U. S. Eng., Custom House, Charleston, S. C. Bids June 4. CD 5/19.

† Boyle Constr. Co., Sumter, S. C., LB $118,331, steam generating plant and distr. sys., No. 38-081-52-63, Shaw Air Force Base, SUMTER, S. C. U. S. Eng., Custom House, Charleston, S. C. Bids June 4. CD 5/19.

KENTUCKY—State Hy. Dpt., Frankfort, rejected bids May 23, bit. surf. Class C 1 8.85 mi. SP 42-408, 42-428, Graves Co. LB $83,407. CD 6/2 under LB.

† Pioneer Constr. Co., 453 Plum St., Memphis, Tenn., LB $239,500, est. $300,000, 3.8 mi. levee work along left bank of Mississippi River, Dyer Co., Serial No. CIVENG 40-041-52-97, TENNESSEE. U. S. Eng., P. O. Box 97, Memphis 1, Tenn. Bids May 29. CD 5/1.

BUILDINGS

LOW BIDS AND CONTRACTS

Schriber Contg. Corp., 615 3rd St. N. E., Wash., D. C., LB $560,000. Page SCHOOL, 14 and Lincoln Sts. ARLINGTON, VA. Bd. Educ., 1426 N. Quincey St., Arlington, Va. Bids June 3. CD 5/23.

▲† Grannis & Sloan, Thompson & Street & Co., R. H. Wattinger, P. O. Box 1847, Charlotte, N. C., CA $1,631,900, BARRACKS, MESS HALL ADMINISTRATION BLDG, GATE HOUSE and entrance facilities with site preparation, NOY 70664, ALBANY, GA. Dpt. Navy, Officer in Charge of Construction, Box 465, Naval Base, S. C. Bids Apr. 3. CD 4/8, under LB.

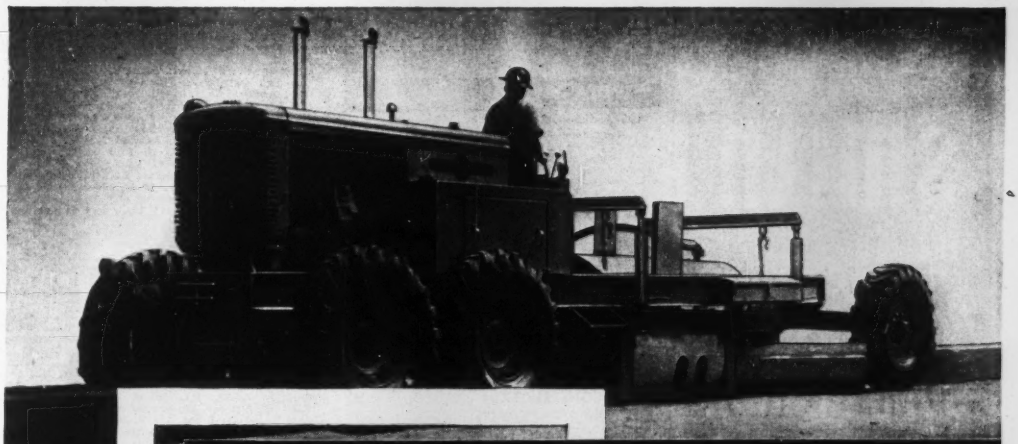
▲† Claussen & Webster, 1395 Gwinnett St., Augusta, Ga., CA, $1,829,967, troop spaces and facilities, Eng 09-133-52-62, CAMP GORDON, GA. U. S. Eng., Post Office Bldg., Savannah, Ga. Bids May 27. CD 6/4.

Leo C. Miller, 335 E. Bloom St., Louisville, Ky. LB $607,975. 2 story hospital addn., GEORGETOWN, KY. John Graves Ford Hospital, Georgetown, Ky. Bids June 4. CD 5/16.

Otho Tapp, 1566 Washington St., Louisville 4, Ky. CA $512,995, general contract 2 story King's Daughters HOSPITAL, SHELBYVILLE, KY. Shelby County Fiscal Court, Shelbyville, Ky. Bids May 27, awarded June 5. CD 6/2.

▲† J. W. Bateson Co., Inc., Irwin-Keasler Bldg., Dallas, Tex., LB $6,081,574, est. $6,000,000. 6 permanent WAREHOUSES, Memphis General Depot, Serial No.

(Continued on page 146)



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Produces Low-Cost Roads for ADAMS COUNTY, COLO.

ABOVE: Section of Adams County road mixed with Model 42 Wood Roadmixer.

BELOW: Left to right: J. C. Moore, President, and Art Schultz, of H. W. Moore Equipment Co., Wood Distributors, Denver, Colorado; Dunie LaTorra, Road Overseer, Adams County; W. T. Waymire, County Road Commissioner, Adams County; and Clyde Caffee of H. W. Moore Equipment Co.

Here is what E. G. Waymire, Chairman, Board of County Commissioners, Adams County, Colorado, has to say about the Model 42 Wood Roadmixer:

"Adams County purchased a Model 42 Wood Roadmixer last fall, and used it very successfully on two of their highways. The first job was completed on a well-traveled county road, serving several oil companies and other businesses requiring heavy truck service. We liked the operation of the Mixer on this job, as we were able to complete this road in a day without interrupting traffic. This road has been in for several months now, and is standing up very well.

"The portability of the Mixer is also of an advantage in our county work. Our county is pretty well spread out and we have many miles to travel from one job to another.

"So far we are very well pleased with the Model 42, and find that our costs of building roads with this machine are much cheaper than any previous method we have used, and that we are also getting a first class mixing job with the machine."

This is another example of how Wood Roadmixers are saving taxpayers' dollars by producing long-life roads at less cost than any other method or equipment used for surface courses or base stabilization.

Why don't you get all the facts on Wood Roadmixers and Wood Roadbuilding Equipment. See your nearest Wood distributor now—or write us direct.

WOOD MANUFACTURING CO

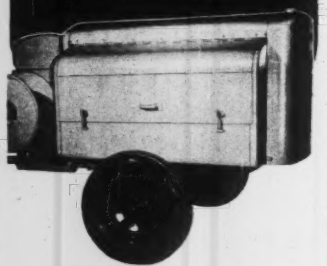
Box 620 • 6900 Tujunga Ave.
North Hollywood, California

Export Office: 3938 Wilshire Blvd., Los Angeles 5, Calif. • Cable Address: Woodor

Now—more than ever!

smith

the *money-saving* COMPRESSOR



smith MODEL 105-P

Lower first cost! Lower upkeep!

In high-cost times, look to the Smith for compressor savings! Delivers 105 cu. ft. per minute—combines heavy duty with light weight; easily portable. Powered with the Chrysler Ind. 15 Industrial engine — 6 cyl., 4" bore, 5" stroke, 377 cu. in., 3" crankshaft, 7 main bearings, sodium cooled valves and Stellite valve seats for heavy duty, long life. Compressor valves—stainless steel disc type with Manganese Bronze seats. Improved type pilot valve and simplified control . . . *Write for literature and prices.*

ALSO the new SMITH 70-P AIR COMPRESSOR

Gordon Smith & Co.

Incorporated

430 College St.

BOWLING GREEN, KY.

(Continued from page 144)

ENG 40-058-52-18, MEMPHIS TENN. U. S. Eng., 303 Federal Office Bldg., Nashville 1, Tenn. Bids June 4. CD 5/27.

MIDDLE WEST

BIDS ASKED—BUILDINGS

† **Ill., Great Lakes**—SCHOOL—B.A. 7/1—Dist. P. Wks. Office, Bldg. 1-A, Ninth Naval District, Great Lakes, GM service school bldg., NOY 72191, Spec. 33920. Plans deposit $50. Extended date. CD 6/5.

Wis., River Falls—LIBRARY—B.A. 7/2—Bd. Regents State Colleges, Madison, library at State College. $600,000. Plans deposit $25. Foeller, Schobers, Berners, Stafford & Jahn, 319 Pine St., Green Bay, archts. CD 4/21.

Ind., Gary—SCHOOL—B.A. 7/18—School, City of Gary, 524 Garfield Ave., 2 story Edison Elementary School addn. $600,000. Perkins & Will, 309 W. Jackson Blvd., Chicago, 6, Ill., archts. Beine, Hall & Curran, 607 Broadway, assoc. archts. CD 10/31.

SOON LETS CONTRACT—BUILDINGS

▲ **Ill., Springfield**—PLANT, etc.—Allis-Chalmers Mfg. Co., 3000 S. 6th St., soon lets contract assembly plant, railroad tracks, sewer and water lines. $15,000-000. Hadley & Worthington, Myers Bldg., archts. CD 6/3.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Pittsburgh-Des Moines Co., Neville Island, Pittsburgh, Pa., CA, **$112,000**, est. $137,000. 500,000 gal. water tower near Walker and Moore Rds., repairs to village intake in Lake Erie, AVON LAKE, O. Village, Avon Lake, O. Awarded June 3.

James McHugh Constr. Co., 6449 S. South Park St., Chicago, Ill., LB, **$303,709**, est. $287,000, pumping station on Delta Ave. as adjunct to Little Miami Sewage Disposal Plant, CINCINNATI, O. City, City Hall, Cincinnati, O. Bids June 3. CD 5/29.

INDIANA—State Hy. Comn., State House Annex, Indianapolis, 4, Ind.,

Calumet Paving Co., Zionsville, Ind.,LB, **$552,000**, est. $615,000. c. conc paving 1.562 mi. State Rd. 39 from State Rd. 67 west of Martinsville to State Rd. 37, Morgan Co. Bids June 6. CD 5/21.

J. W. Sweet, Cambridge City, Ind., CA, **$89,000**. reln.-con., steel bridge over Whitewater River, Cambridge City, RICHMOND, IND. Bd. Comrs. Wayne Co., Court House, Richmond, Ind. Bids June 3. CD 5/6.

WISCONSIN—State Hy. Comn., Madison,

Harold B. Janke, Fredonia, Wis., LB, **$129,004**. Contract 1, structure B-45-7 and approaches 0.549 mi. the Klug Bridge and Approaches. C. T. Hy. "C" S 0794 (1), Ozaukee Co.;

Industrial Constr. Co., 3050 4 Ave. S. Minneapolis, Minn., LB, **$101,605**, Contract 1, structure B-54-727, The South County Line-Sheldon (Jump River Bridge) Road C.T. Hy. "C" Proj. S 0892 (1), Rusk Co. Bids June 3. CD 5/19.

WISCONSIN—State Hy. Comn., Madison,

Victor Nelson, Superior, Wis., Contr. 1, LB, **$303,269**, Contracts 1 and 2, ballast and base course 9.182 mi. Cable-Drummond Rd., U.S. Hy. 63 F 011-2 (28), Bayfield Co.;

F. C. Raemisch & Son, Waunakee, Wis., LB, **$462,544**, Contract 2, grading, draining, structure 2.317 mi. South Madison Belt Line (C.T.H. "D"-Monana Section) U.S. Hys. 12 and 18, F 04-2 (21), Dane Co.;

John F. Bloomer Co., Appleton, Wis., LB, **$329,722**, Contract 1, ballast course 8.34 mi. The Rhinelander-Eagle River Rd. S.T. Hy. 17 T 0287 (1) and T 0287 (2), Oneida and Vilas Counties;

Rock Road Constr. Co., 5711 Winnequah Rd., Madison, Wis., LB, **$136,602**, Contract 1, single aggregate bit. 6.762 mi. U.S.H. 51-C.T.H. "K" Road, S.T. Hy. 54 S 033 (2), Portage Co.;

cancelled bids to have been opened June 3 Contract 1, c. conc. 0.838 mi. First St., Nicolet Blvd. and Ahnaip St., City of Neenah and Menasha City Streets U-560 (4), Winnebago Co. Bids June 3. CD 5/19.

WISCONSIN—State Hy. Comn., Madison, rejected bids June 3, ballast and base course 9.182 mi. Contract 1, Cable-Drummond Rd., U.S. Hy. 63, Bayfield Co., LB, **$259,857**. CD 6/9, under LB.

WISCONSIN—State Hy. Comn., Madison,

S. J. Groves & Sons Co., 500 Wesley Temple Bldg., Minneapolis, 3, Minn., CA, **$310,763** Contract 1, grading, draining, base course 8.34 mi. Rhinelander-Eagle River Rd., S.T. Hy. 17, Proj. T 0287 (1) and T 0287 (2), Oneida and Vilas Counties. Bids June 3. CD 5/19.

MICHIGAN—State Hy. Dpt., 222 Townsend St., Lansing, Zone 13, rejected bids May 27, b.-conc. 10.877 mi. M-48 US-2 and ferry approaches, M 49-7 C3, M 17-15, C7, M 49-32 C3, M 49-28 C10, M 49-47 C3, Mackinac and Chippawa Counties. CD 5/21.

MICHIGAN—State Hy. Comn., 222 Townsend St., Lansing, Zone 13,

Globe Constr. Co. & Mid-American Engineering Corp., St. Joseph, Mich. CA, **$668,513**, est. $670,000. b.-conc. 20.609 mi. US-131, M 59-3 C2, M 54-7 C10, Montcalm and Mecosta Counties. CD 6/4, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Wigton-Abbot Corp.**, 1225 South Ave., Plainfield, N. J., CA, Est. **$8,000,000**. design and construct, 170,000 sq. ft. 1 story PLANT for automotive parts and forgings, with high-level bay for forging and heat-treating operations, MARION, O. Eaton Mfg. Co., 739 E. 140 St., Cleveland, O.

Ragner Benson Inc., 4744 W. Rice St., Chicago 51, Ill., CA, LB, Approx. **$580,740**. WESTERN UNION BLDG., La Salle St. and Congress Expressway, CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids May 29. CD 5/14.

J. Emil Anderson Co., 1809 Balmoral St., Chicago, 40, Ill., CA, **$130,000**, FACTORY addn., CHICAGO, ILL. Monark Silver King Co., Natchez and Grand Sts., Chicago, Ill. Arthur M. Heda, 1809 Balmoral St., Chicago, 40, Ill., archts. Awarded June 2.

Dennis Constr. Co., 134 N. La Salle St., Chicago, 2, Ill., CA, **$85,000**, PLANT addn., CHICAGO, ILL. Calumet Candy Co., Colfax and 83 Sts., Chicago, Ill. Fitch, Schiller & Frank, 100 W. Chicago Ave., Chicago, 10, Ill., archts. Awarded May 29.

▲ **Carl E. Erickson Co.**, 4657 Ravenswood St., Chicago, 40, Ill., CA, **$1,000,000**, 1 story, 150,000 sq. ft. FACTORY and SALES OFFICE, CHICAGO, ILL. Allied Radio Co., Western Ave. and Washington Blvd., Chicago, Ill. Bids Apr. 11, awarded May 29. CD 3/20.

Edwin M. Hartrich & Son, 141 W. Jackson Blvd., Chicago, 4, Ill., CA, **$250,000**, 22,000 sq. ft. FACTORY and OFFICE, CHICAGO, ILL. McCarthy Steel Co., 7410 S. Ashlad St., Chicago, Ill. CD 5/28.

W. H. Lyman Constr. Co., 134 N. La Salle St., Chicago, 2, Ill. CA, **$300,000**, GARAGE, CICERO, ILL. Illinois Bell Telephone Co., 212 W. Washington St., Chicago, 6, Ill. Bruce A. Gordon, 1 N. La Salle St., Chicago 1, Ill., engr. Awarded May 27.

Tonyan Constr. Co., 100 Borden St., McHenry, Ill., CA, **$325,000**, 1 story, bsmnt., South Grade SCHOOL, CRYSTAL LAKE, ILL. School District 47, Crystal Lake, Ill. Bids Apr. 29, awarded May 29. CD 4/23.

Charles B. Johnson & Son, 122 S. Michigan St., Chicago, 3, Ill., LB, **$580,000**, Intermediate SCHOOL, HIGHLAND PARK, ILL. School Dist. 108, Highland Park, Ill. CD 8/15.

S. N. Nielson Co., 3059 Augusta Blvd., Chicago, 12, Ill. CA, **$230,000**, FACTORY addn., SKOKIE, ILL. Woodall Industries Ind., 3500 Oakton St., Skokie, Ill. Bruce A. Gordon, 1 N. La Salle St., Chicago, 2, Ill., archt.

Siesel Constr. Co., 514 E. Ogden St., Milwaukee, 2, Wis., CA, **$681,000**, HOME for the Aged Addn., MILWAUKEE, WIS. Milwaukee Protestant Home for the Aged, 2449 N. Downer Ave., Milwaukee, 11, Wis. Bids May 28. CD 6/4, under LB.

Johnson & Henrickson, 422 Dodge St., Racine, Wis., CA, **$613,100**, Y.W.C.A. Bldg., RACINE, WIS. Young Women's Christian Assn., 312 7 St., Racine, Wis. Awarded May 21. CD 3/25.

Hutter Constr. Co., Fond du Lac, Wis., LB, **$707,468**, general contract PATIENTS BLDG. and Central State HOSPITAL alterations, WAUPUN, WIS. State Dpt. P. Welfare, Madison, Wis. Bids June 4. CD 5/7.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Colo., Colorado Springs**—B.A. 7/1—U. S. Eng., 1709 Jackson St., Omaha, Neb., utilities at Ent Air Force Base, Inv. 52-104.

BIDS ASKED—BUILDINGS

▲ **Mo., Kansas City**—PSYCHIATRIC RECEIVING CENTER—B.A. 6/24—City, c/o Reed McKinley, dir. Dpt. P. Wks., general, plumbing, heating, ventilating, electric, air conditioning contracts 3 story, Psychiatric Receiving Center, 22 and McCoy Sts., $1,200,000, Cooper, Robison & Carlson, Commerce Bldg., Kansas City, Mo., archts. 1CD 11/29/51.

SOON LETS CONTRACT—BUILDINGS

Tex., Corpus Christi—WAREHOUSE—Houston Natural Gas Corp., 1316 Texas St., Houston, soon lets contract 14,000 sq. ft., hollow tile, brick warehouse and facilities, concrete fdn. Approx. $100,000. Plans deposit $25. Nat W. Hardy, 60 Country Club Pl., archt. CD 5/21.

HEAVY CONSTRUCTION

LOW BIDS—CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

Anderson & Sons, 100 N. 7 St., Minneapolis, Minn. CA **$1,449,840**. paving 7.3 mi. between Wayzata and Dakota Ave. in St. Louis Park, Hennepin Co.;

Megarry Bros., St. Cloud, Minn. CA **$620,884**. grav. base, plant-mixed bit. surf. 19 mi. between Big Lake and 2.4 mi. south of North Sherburne Co. line, and in St. Cloud and Sauk Rapids, Sherburne, Stearns and Benton Counties. CD 6/2, under LB.

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

S. J. Groves & Sons Co., 510 Wesley Temple Bldg., Minneapolis, Minn. CA **$469,891**. paving 3 mi. at LaCresecent, Houston Co. Bids May 9. CD 4/24.

P. Zimmerman, Brodhead, Wis. CA **$54,239**. constr. County Ditch No. 47-A, 365,788 cu. yd. excav., drain tile, sec. concrete pipe, etc., ST. PETER, MINN. Nicollet Co., H. Overn, aud., St. Peter, Minn. Bids Apr. 21. CD 4/10.

MISSOURI—State Hy. Comn., Jefferson City,

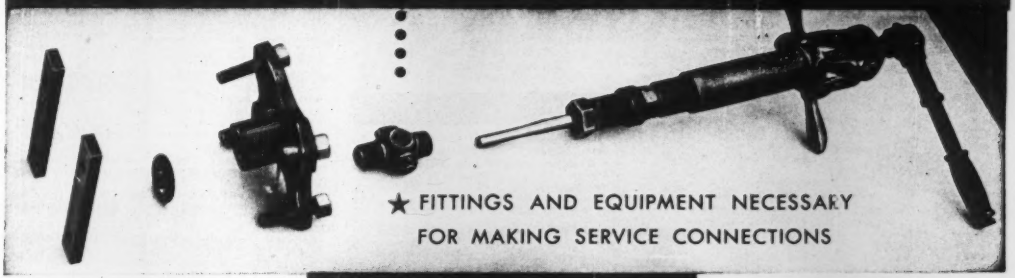
Stupp Bros. Bridge & Iron Co., 2800 Weber Rd., St. Louis, Mo. and **Mississippi Valley Structural Steel Co.**, 3117 Big Bend Rd., St. Louis, Mo. CA **$647,006**. steel work for 33 spans variable length 2,000 tons, City of St. Louis;

American Bridge Co., Div. U. S. Steel Co., 1221 Locust St., St. Louis, Mo. CA **$643,313**. steel work for 31 spans, variable length 2,000 tons, City of St. Louis. Bids May 23, awarded June 4. CD 5/28, under LB.

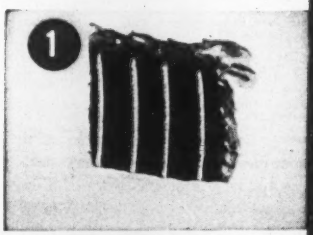
Tri-State Excavating Co., 626½ 1st Ave. N., Fargo, N. D., CA. **$72,448**, wash water line and storm sewers, FARGO, N. D. Bids May 13.

(Continued on page 148)

SERVICE CONNECTIONS are no problem in LOCK JOINT Reinforced Concrete CYLINDER PIPE

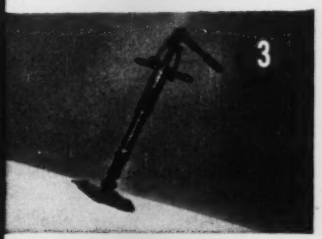


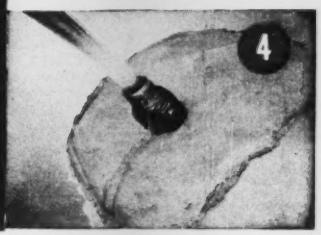
★ FITTINGS AND EQUIPMENT NECESSARY FOR MAKING SERVICE CONNECTIONS



HOW TO TAP

1. Remove concrete down to cylinder in area to be tapped.
2. Assemble fittings around bars of reinforcing cage, drawing gland down firmly so that gasket fits tightly against cylinder.
3. Mount tapping drill on corporation stop and tap.
4. When tap is completed, protect steel fittings with a cement mortar encasement.





Making a service connection under pressure in a Lock Joint Reinforced Concrete Cylinder Pipe is that simple.

Yet with these few steps a foolproof tap is always achieved. There can be no cross-threading, no loss of alignment and no damaging of the pipe with attendant costly shut-downs and repairs.

Lock Joint Pipe Company will be glad to furnish, at nominal cost, the few fittings necessary to make service connections from ¾" to 2" in diameter in any pressure pipe of Lock Joint design. Fittings are also available for making large diameter flanged connections—with ease under pressure. For illustrated instructions on tapping any type of Lock Joint Pressure Pipe, write for booklet, "Tapping Lock Joint Pressure Pipe Under Pressure."

LOCK JOINT PIPE COMPANY

Est. 1905

P. O. Box 269, East Orange, N. J.

Pressure Pipe Plants: Wharton, N. J., Turner, Kan., Detroit, Mich., Columbia, S. C.

BRANCH OFFICES:

Casper, Wyo. • Cheyenne, Wyo. • Denver, Col. • Kansas City, Mo. • Valley Park, Mo. Chicago, Ill. • Rock Island, Ill. • Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn. Tucumcari, N. Mex. • Oklahoma City, Okla. Tulsa, Okla. • Beloit, Wis. • Hato Rey, P. R.

SCOPE OF SERVICES

Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply Distribution Mains in a wide range of diameters as well as Concrete Pipes of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

(Continued from page 146)

Jansen Contg. Co., Beatrice, Neb., CA. $59,842. est. $60,086, sanitary sewers, YUTAN, NEB. City, City Hall, Yutan, Neb.; Henningson, Durham & Richardson, Standard Oil Bldg., Omaha, Neb., engrs. Bids June 2. CD 5/14.

† **Martin K. Eby Constr. Co.**, 610 N. Main St., Wichita, Kan. CA $677,285, est. $813,047 hydrant refueling, facility, bulk storage, Eng. 23-028-52-40, Forbes Air Force Base, TOPEKA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids June 3. CD 4/29.

▲† **Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Ia. CA $1,687,572, est. $1,761,528. asph. runway and taxiways, Eng. 23-028-52-54.

Kaw Valley Paving Co., First and Topeka Sts., Topeka, Kan. CA $1,087,507. airfield apron, Forbes Air Force Base, TOPEKA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids May 23, awarded June 5. CD 6/2, under LB.

† **Fredericksen-Parks, Inc.**, 25 N.E. 28 St., Oklahoma City, Okla., LB $75,636. rehabilitation roads and bridges, Naval Air Technical Training Center, NOY 71883, NORMAN, OKLA. Dpt. Navy, 8th Naval Dist., Bldg. 16, Naval Station, New Orleans, La. Bids May 28. CD 5/15.

H. J. Hoppel, 5501 E. Admiral St., Tulsa, Okla., CA. Approx. $225,000. c. conc. pavement in the Valley Charles addn., TULSA, OKLA. O. U. Campbell, 1642 S. Boston St., Tulsa, O. Mansur & Steele, 1642 S. Boston St., Tulsa, Okla., engrs. Awarded May 29.

TEXAS—State Hy. Dpt., Highway Bldg., Austin, cancelled bids to have been opened June 17, grading, base and surf. 3.276 mi. Hy. F.M. 1105 from Medina Co. line to 3.3 mi. east. Control No. R 849-101, Bexar Co; grading, structures, base surf. 26.112 mi. Hy. FM 1787 and 1788, Control No. 1717-1 and 2-1 and 1, 1718-1 and 2-1 and 1, FP No. S 1794 (1) and S 1805 (1), Ector, Midland and Upton Counties. CD 6/3.

† **Standard Dredging Co.**, 320 Cotton Exchange Bldg., Galveston, Tex., LB $304,845, est. $400,000. dredging Houston Ship Channel from Morgans Point to vicinity Red Fish Reef, Inv. No. CIVENG 41-243-52-87, TEXAS. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids June 3. CD 5/26.

Central Telephone Co-operative, Brady, Tex., Purchase and Hire. $68,500, addnl. pole telephone rural lines constr. at Brady, McCulloch Co.; $63,000, last of pole telephone line constr. in rural areas, San Saba, San Saba Co.; Approx. $60,000, addnl. telephone pole lines, at Goldthwaite, Mills Co., TEXAS. Grand total $191,500. CD 12/5.

Lone Star Gas Co., 1915 Wood St., Dallas, Tex., Force Account, $250,000. construct an addnl. unit of loop line around city, 16 in. pipe, DALLAS, TEX. CD 1/22.

▲† **Hill & Combs**, 321 Melrose St., San Antonio, Tex., CA $1,140,960. G.C.A. facilities, incl. buildings, warehouse at Brooke Medical Center, Fort Sam Houston, Inv. No. Eng. 41-243-52-100, SAN ANTONIO, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids May 17, awarded June 3. CD 5/27, under LB.

COLORADO—State Hy. Dpt., Denver;
J. H. & N. M. Monegham, Derby, Colo., LB. $939,307, est. $963,693, grading, structures, stabilization; oil processing 9.067 mi. State Hy. 96, AD-AF-9 (1), Pueblo Co. Bids June 4. CD 5/27.

Latimer Constr. Co., 930 Wyandot St., Denver, Colo., LB $575,619, est. $700,000, Storm Sewer District 372, DENVER, COLO. City and Denver Co., City and County Bldg., Denver, Colo. Bids June 3. CD 5/27.

Stromberg-Carlson, 100 Carlson Rd., Rochester, N. Y. LB $86,139, construct facilities and equipment, NEW MEXICO, Roosevelt County Telephone Co-operative, Portales, N. M. Bids May 28. Hasie & Green, Box 1139, Lubbock, Tex., engrs. Bids May 28. CD 10/3.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Byers Constr. Co.**, 6 E 11 St., Kansas City, Mo. CA $2,500,000. 300 individual DWELLINGS, on 80 acre tract US 71 bypass and Missouri 10 Hys., LIBERTY, MO. Home Federal Savings & Loan Assoc.; C. E. Curry, pres. 1000 Grand Ave., Kansas City, Mo.

Dickie Constr. Co., 317 N. 11 St., St. Louis 1, Mo. LB $456,954. general contract brick, rein.-con. 4 story top addn. to present 4 story, bsmnt., 46x139 ft. and 46x58 ft. HOSPITAL, 4514 McMillan Ave., ST. LOUIS, MO. Missouri Baptist Hospital, 919 N. Taylor St., St. Louis 8, Mo. Bids May 29. CD 5/15.

† **U. S. Eng.**, Fort Lincoln, P.O. Box 300, Bismarck, N. D. cancelled bids to have been opened June 6, construct RESIDENCES in New Town and in western segment of the Fort Berthold Indian Reservation, Serial No. CIVENG 32-015-52-53, NORTH DAKOTA. CD 5/23.

Lueder Constr. Co., Redick Tower, Omaha, Neb., CA $250,000. WAREHOUSE and OFFICE, OMAHA, NEB. H. A. Marr Grocer Co., 1201 Jones St., Omaha, Neb. Cecil Martin Karbach Block, Omaha, Neb., archt.

Lone Star Gas Co., 1915 Wood St., Dallas, Tex. Force Account, Approx. $300,000. Gas PLANT enlargement, DALLAS, TEX. CD 1/18.

T. C. Bateson Constr. Co., 618 Irwin-Keasler Bldg., Dallas, Tex., LB $567,682, est. $665,000, Tex. 17-5, No. 1 Oleander HOMES, low cost housing, superstructures for 95 apartments in 14 masonry type bldgs., GALVESTON, TEX. Galveston Housing Auth., City Hall, Galveston, Tex. Bids May 29. CD 5/8.

▲ **United Aircraft Corp. (Chance-Vought)**, Grand Prairie, Tex. Purchase and Hire. $1,300,000. PLANT expansion, GRAND PRAIRIE, TEX.

J. S. Norman Building Corp., c/o J. S. Norman, 4515 Richmond Rd., Houston, Tex. Owner Builds. $488,000. Job. No. 4, 34 DWELLINGS, HOUSTON, TEX. CD 1/24.

Western Supply Co., West Bldg., Houston, Tex. Own Forces. Approx. $400,000. Proj. 3, 55 DWELLINGS, HOUSTON, TEX. CD 2/26.

L. W. Helms, 71 E. Burgess St., Houston, Tex., Purchase and Hire. Approx. $475,000. Proj. 3, 50 DWELLINGS, HOUSTON, TEX. CD 1/30.

▲ **E. I. duPont de Nemours & Co.**, Orange, Tex. Owner Builds. $6,500,000. polythene chemical PLANT unit, ORANGE, TEX. CD 2/13.

Embe Building Co., 6901 Almeda Rd., Houston, Tex., Owner Builds. Approx. $310,000. 45 DWELLINGS, PASADENA, TEX. CD 2/26.

E. J. Burke & Sons, Goliad Rd., San Antonio, Tex. Owner Builds. $337,500, Unit 13, 45 DWELLINGS, SAN ANTONIO, TEX. CD 2/25.

FAR WEST

BIDS ASKED—BUILDINGS

▲ **Calif., Port Hueneme**—HOUSING—B.A. 7/2—Dpt. Navy, San Diego, construct, manage and finance Naval Housing Project N-13. $1,000,000.

▲ **Calif., Barstow**—HOUSING—B.A. 7/8—Dpt. Navy, San Diego, construct, manage and finance, Naval Housing Project N-21. $1,000,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

NEVADA—State Hy. Dpt., Carson City
George E. Miller, P. O. Box 1728, Reno, Nev., CA $66,780. roadmix surf. 18 mi. between Cleve-Piermont Creeks, White Pine Co.; CA $72,207, roadmix surf. 17.6 mi. near Conner Station to 7 mi. east of Tuscarora, Elko Co.;
Dodge Constr. Inc., N. Maine St., Fallon, Nev., CA $73,824, roadmix surf. 12.1 mi. from Lander to Eureka Co. line, Eurega Co. Grand total $212,811. Bids May 29. CD 5/22.

WASHINGTON—State Hy. Dpt., Olympia,
Statewide Equipment Co., 409 Puyallup Ave., Tacoma, Wash., CA, $98,503, rein.-con. continuous girder bridge over Stuck River together with grading, surf. approaches Pierce Co. Bids June 3. CD 5/22.

WASHINGTON—State Hy. Dpt., Olympia,
F. R. Hewett, Parkwater, Wash., CA $125,601. llght blt. surf. 14.68 mi. State Hy. 4-A. Malo to Curlew and Curlew access road, Ferry Co. Bids June 3. CD 5/22.

Jentoft & Forbes, 910 W. 45 St., Seattle, Wash. LB $71,176, Lakewood moorage basin, SEATTLE, WASH. Park Dpt., 100 Dexter Ave., Seattle, Wash. L. Shorett, Securities Bldg., Seattle, 1, Wash., archts. CD 5/29.

† **Fraser's Boiler Service Inc.**, 703 Dearborn St., Seattle, Wash., LB, $135,671, furnishing, installing two 34 000 lb.-per hour BOILERS at Ault Field. Spec. 33198, WHIDBEY ISLAND, WASH., P. Wks. Officer, Thirteenth Naval Dist., 1611 W. Wheeler St., Seattle, Wash. Bids June 3. CD 4/26/51.

† **General Electric Co.**, River Rd., Schenectady, N. Y. LB $60,304, Schedule 230 kv bus structure equip. for McNary power house, CIVENG 45-164-52-101, OREGON. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids May 28. CD 4/30.

† **Williamette Iron & Steel Co.**, 3050 N. W. Front St., Portland, Ore., LB $767,783, furnishing, installing fishpassing facilities at McNary Dam, Inv. 52-102, OREGON. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids June 3. CD 4/29.

▲† **Winston Bros. & Johnson Constr. Co.**, 1530 California St., Monrovia, Calif., LB, $6,075,723 Nimbus Power Plant, diversion dam on American River Spec. DC 3713, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Folosm, Calif. Bids June 5. CD 5/7.

CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles
A. Teichert & Son, Inc., P. O. Box 1113, Sacramento, Calif., LB, $508,216, completing partly finished contract, North city limits of Los Angeles to Pico Canyon Rd., Los Angeles Co.

CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento.
Gordon H. Ball & Sam Ramon Valley Land Co., 685 Delaware St., Berkeley, Calif., CA, $552,246, constr. 4.8 mi. road north of Pisley and south of Tipton, Tulare Co. Bids May 21. CD 5/27, under LB.

CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,
Granite Constr. Co., Box 900, Watsonville, Calif., LB, $674,331, wid'n. 9 mi. roadway, etc. between Templeton and Paso Robles, San Luis Obispo Co.;
Clements & Co., P. O. Box 277, Hayward, Calif., LB $109,581, construct 3.3 mi. road between Pennington and Wade Rd.; Butte Co. Bids June 4. CD 5/12.

A. Teichert & Son, Inc., 1931 Stockton Blvd., Sacramento Calif., CA $639,761, sanitary and storm sewers, paving etc. in Assessment Dist. 5, ANTIOCH, CALIF. City, City Hall, Antioch, Calif. Bids Apr. 28, awarded May 28. CD 5/6, under LB.

McCammon-Wunderlich Co., 2555 Pulgas Rd., Palo Alto, Calif. LB, $72,847, street imprvts. for Cirpiani School Improvement Dist., BELMONT, CALIF. City, City Hall, Belmont, Calif. Bids May 26.

▲† **Allison Honer & Cox Brothers Constr. Co.**, 312 N. Main St., Santa Ana, Calif., LB, $2,941,000 expansion of field training facilities at Camp Pulgas, NOY 72622, Spec. 33812, CAMP PENDLETON, CALIF. Dpt. Navy, Eleventh Naval Dist., San Diego, Calif. Bids May 21, CD 4/25.

Duncanson-Harrelson Co., 530 West Cutting Blvd., Richmond, Calif., CA, $623,500, rein.-con. marginal wharf on precast concrete piles at Crokett refinery CROCKETT, CALIF. California & Hawaiian Sugar Refining Corp., Ltd., 215 Market St., San Francisco, Calif. Bids May 27, awarded June 2. CD 5/2.

McCammon-Sunderlich Co., P. O. Box 1023, Palo Alto, Calif., CA $136,289, imprv. portions Portola Rd., Alpine Rd., etc., totalling 3.9 mi. REDWOOD CITY, CALIF. San Mateo Co., Court House, Redwood City, Calif. Bids June 4.

L. C. Smith, First and Railroad Sts., San Mateo, Calif., LB, $100,291, pavements and sanitary and storm sewers in Brittan Ave., RI 1952-45, SAN CARLOS, CALIF. City, City Hall, San Carlos, Calif. Bids May 23. CD 4/24.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Groves, Shepherd, Wilson & Kruge**, 120 6 Ave. N. Seattle, Wash., CA, $2,245,751, twenty-two 52x103 ft. AMMUNITION MAGAZINES, eleven 31x83 ft., high EXPLOSIVE MAGAZINES, three 22x29 ft. FUSE and DETONATOR MAGAZINES and four 50x203 ft. STANDARD INERT WAREHOUSES, all rein.-con., Naval Ordnance Depot, Spec 30403, BANGOR, WASH. P. Wks. Office, Thirteenth Naval Dist., 1611 W. Wheeler St., Seattle, Wash. Bids May 15. CD 5/21, under LB.

Asotin Co. Housing Auth., Clarkston, Wash., cancelled bids to have been opened June 27, 50 HOUSING units CLARKSTON, WASH. $350,000 CD 6/6.

Roy L. Bair & Co., 1220 Ide St., Spokane, Wash., LB $756,889, Employee's HOUSING at Lakeland Village MEDICAL LAKE, WASH., State Dpt. P. Institutions, Olympia, Wash. Bids June 4. CD 5/13.

Standard Constr. Co., 315 E. 25 St., Tacoma, Wash., LB, $554,988, general contract 87,000 sq. ft., steel masonry Junior High SCHOOL, TACOMA, WASH. Clover Park School District 400, 5214 Steilacoom Blvd., Tacoma, Wash. Bids June 4. CD 5/19.

Ray V. Anderson, 5742 Venice Blvd., Los Angeles, Calif., LB, $383,790, HEADQUARTERS OFFICE, alterations, addns. Dpt. Motor Vehicles, LOS ANGELES, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento Calif.

Oppenheim & King, Inc., 1120 Parallel St., Fresno, Calif., CA, $925,529, Washington, McCabe Junior, and McCabe Senior Elementary SCHOOLS, MENDOTA, CALIF. Mendota Union School Dist., Mendota, Calif. Bids Apr. 16, awarded May 29. CD 4/28, under LB.

▲† **Rothschild, Raffin & Weirick, and Jas. I. Barnes, Constr. Co.**, 299 Kansas St., San Francisco, Calif., LB, $4,418,300, 6 story, rein.-con, structural steel LABORATORY, at Naval Radiological Defence Laboratory at San Francisco Naval Shipyard, NOY 72363, Spec. 32780, SAN FRANCISCO, CALIF. Twelfth Naval Dist., P. Wks. Office, San Bruno, Calif. Bids June 4. CD 5/8.

Martinelli Constr. Co., 580 Folsom St., San Francisco, Calif., LB $393,340, Douglas Elementary SCHOOL, SAN FRANCISCO, CALIF. Dpt. P. Wks., City Hall San Francisco, Calif. Bids June 5. CD 5/16.

▲† **David D. Bohannon Organization**, 895 San Mateo Dr., San Mateo, Calif., CA, Approx. $6,000,000, 3 floor DEPARTMENT STORE, Hillsdale, SAN MATEO, CALIF. Macy's, Stockton and O'Farrell Sts., San Francisco, Calif. Welton Beckett & Assocs., 3455 19 Ave., San Francisco, Calif., and 6357 Wilshire Blvd., Los Angeles, Calif., archts. Awarded June 2.

ALASKA

BIDS ASKED—BUILDINGS

Alaska, Palmer—HOSPITAL—B.A. 7/14—Valley Hospital Assn., Palmer, steel, concrete hospital. $400,000. E. B. Crittenden, P.O. Box 358, Anchorage, archt. CD 5/1/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Munter Constr. Co.**, Vance Bldg., Seattle 1, Wash., LB, $688,449, est. $405,900, street constr., trestles, bulkheads, widen, paving, sidewalks, lighting and service utilities, Proj. Aaa 60-A-65, KETCHIKAN, ALASKA. Alaska P. Wks., Dpt. Interior, Juneau, Alaska. Bids June 4. CD 4/30.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Alaska Associates, Inc.**, Anchorage, Alaska, Day Labor. Approx. $2,000,000. 125 HOUSES in Airport Heights area, ANCHORAGE, ALASKA. CD 5/29.

† **Johnson Constr. & Maintenance Co.**, Anchorage, Alaska, LB, $541,450, est. $500,000. 22,700 sq. ft. Woodland Park Elementary SCHOOL, Proj. Aaa-50-A-130, ANCHORAGE, ALASKA. Alaska P. Wks., Dpt. Interior, Juneau, Alaska. Bids June 4. CD 4/30.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

M. F. Schurman Co. Ltd., Eustane St., Summerside, P. E. I. CA, $250,000, standard ARMAMENT bldg. at Air Force base, CHATHAM, N. B. Defence Constr. Ltd., 1032 Gottingen St., Halifax, N. S. Bids May 6. CD 4/18.

Tidewater Constr. Co., Ltd., 7 Parkdale Ave., New Glasgow, N. S., CA, $123,796, breakwater, HALF ISLAND COVE, N. S., Govt. of Canada, Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids May 29. CD 5/14.

T. D. K. Rooney 132 Clarence St., Kingston, Ont., CA $304,000. relief sewer, KINGSTON, ONT. City, City Hall, Kingston, Ont. Bids May 25 awarded June 3. CD 5/8.

Le Bee Constr. Ltd., 2052 W. Ste Catherine St., Montreal, Que., CA, $150,000, concrete sidewalks and curbs, various streets, MONT LAURIER, QUE. Municipality, Mont Laurier, Que. Lalonde & Assocs., 7379 St. Hubert St., Montreal, Que., engrs.

BUILDINGS

LOW BIDS AND CONTRACTS

Chas. Crenna, 216 Elizabeth St., Guelph, Ont. CA, $500,000, 1 and partly 2 story, 167x242 ft., steel, brick, tile Cooksville High SCHOOL, COOKSVILLE, ONT. South Peel High School Area Bd., T. H. Barrett, chn., Port Credit, Ont. Bids May 27, awarded June 3. CD 5/19.

Ball Brothers Ltd., 49 King St., E., Kitchener, Ont., CA, $500,000, 4 story, bsmnt., 85x133 ft., concrete, steel frame, brick PLANT EXTENSION, KITCHENER, ONT. Dominion Rubber Co. Ltd., 149 Strange St., Kitchener, Ont. Bids June 3, awarded June 4. CD 5/23.

J. E. Lamarre, 140 St. Dominique St., Jonquiere, Que. CA, $319,000, SCHOOL addn., PORT ALFRED, QUE. School Comn., Port Alfred, Que. Lamontagne & Gravel, 187 Racine St., Chicoutimi, Que., archts.

Proposed Projects

WATER SUPPLY

N. C., Fayetteville—City, water filtration plant addns. $500,000. Wm. C. Olsen, 5 Exchange Pl., Raleigh consult. engr.

Pa., Sharon—Consumers Water Co., Sharon, water filtration works. $100,000. Alvord Burdick & Howson, 20 N. Wacker Dr., Chicago 6, Ill., consult. engrs.

Tex., Houston—A. J. Whipple & R. F. Jordan, 2436 Bissonnet St., water plant and sys. in area of 575 acre tract off Westheimer Rd. $115,000. Hilton & Coulson, 3821 Fannin St., consult. engrs.

Wash., Port Angeles—City, City Hall, 18,000 ft. 20 in. supply line, $289,000; replace pipe from reservoir to 9 St., $51,400; emergency pumping stations, $34,200; feeder lines from pumping station $51,500. John W. Cunningham & Assocs., Spalding Bldg., Portland, Ore., consult. engrs. CD 5/26.

SEWERS, WASTE DISPOSAL

Calif., San Diego—City, Civic Center, Installing sanitary sewers in various streets. $293,233. Alden K. Fogg, c/o owner, engr. CD 4/1/46.

Colo., Englewood—South Englewood Sewer District, 2737 S. Bannock St., Englewood, sewer lines and disposal plant in South Englewood on Platte River near Petersburg ditch, $450,000. Carroll H. Coberly, 1441 Welton St., Denver, consult. engr. CD 5/9.

Ind. ,Crawfordsville—Bd. P. Wks., City Hall, East Side Sanitary Sewerage System, $133,715. Lex Colore, City Hall, city engr.

Mass., Lexington—Town Dpt. P. Wks., Town Hall, sewer extensions, various locations, $150,000, Whitman & Howard, 89 Broad St., Boston, consult. engrs. CD 5/5.

N. Y., North Syracuse—Village, sanitary sewerage sys. incl. 74,00 ft. sewers, 6,600 ft. force main and 3 pumping stations. $743,000.

O., Bedford—City, City Hall, 683 Broadway, enlarging capacity of sewage disposal plant, $374,000. R. F. McDowell, c/o owner, city engr. CD 11/13.

Okla., Tonkawa—City, sewage disposal plant. $150,000. V. V. Long & Co., Colcord Bldg., Oklahoma City, consult. engr. CD 1/23.

Tex., Clute—Clute Water Bd., c/o R. W. McKinney, chn. Bd., Clute, voted bonds June 3, Job. 1, sewage disposal plant, $60,000; Job 2, sanitary sewers lines, $65,000. A. S. Russell, Rosenberg, consult. engr.

Tex., Houston—Aubry Fariss, Commerce Bldg., sanitary sewers, $65,000; storm sewers, $60,000, in region of Kirby Dr. and San Felipe Rd. Robert M. Atkinson, 1st Natl. Bank Bldg., consult. engr.

Tex., Houston—M. J. Whipple & R. F. Jordan, 2436 Bissonnet St., sanitary sewerage sys., $135,000; storm sewers, drainage, excavating, grading, all site earthwork, $150,000 in an area of 575 acre tract off Westheimer Rd. Hilton & Coulson, 3821 Fannin St., consult. engrs.

Tex., San Antonio—E. J. Burke & Sons, Inc., Goliad Rd., sanitary sewers, $62,500; storm sewers, drainage, site earthwork, grading, etc. $65,000, on 25-acre plot, adjacent Coliseum Park.

BRIDGES

▲ Tex., Port Isabel—Cameron Co., Court House, Brownsville, tax bond issue July 1, causeway construction, Port Isabel to Padre Island. $2,500,000. A. Tamm, Harlingen, consult. engr. CD 5/19, under LB.

STREETS AND ROADS

Ala., Mobile—City, City Hall, sidewalk imprvs. $330,000. CD 12/20/49.

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Ill., **Des Plaines**—City, City Hall, paving Graceland Ave. from Prairie to Ellinwood, Webford Ave. east of Graceland Ave., Prairie Ave. west of Pearson St. $125,000.

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Rutland—hy. reconstr. Rte. 122A, S 75 (7). $330,000.

Mich., Grand Rapids—City, 2 in. b. conc. resurf. various streets. $375,000. CD 11/13/44.

Tex., Gilmer—City, voted bonds May 31, street imprvs., paving, $100,000. Wisenbaker & Fix, Tyler, consult. engrs.

Tex., Houston—A. J. Whipple & R. F. Jordan, 2436 Bissonnet St., streets and roads, in area of 575 acre tract off Westheimer Rd. $150,000. Hilton & Coulson, 3821 Fannin St., consult. engrs.

▲† **ALASKA**—Alaska Road Comn., Dpt. Interior, Juneau, highway from Anchorage to Nome. $40,000,000. A. F. Ghilgione, c/o owner, hy. comr.

EARTHWORK, WATERWAYS

Utah—Moon Lake Electric Co-operative Dist., Altamont, dam and hydro-electric plant on Lake Fork, a tributary of Duchesne River at Altamont. Clyde C. Kennedy Co., 604 Mission St., San Francisco, Calif., consult. engrs.

AIRPORTS

† **Calif., Sacramento**—DEPOT—U. S. Eng., Wright Bldg., Sacramento, transportation control depot, incl. warehouse, railroad spur, equipment shed, oil storage salvage area, vehicle processing bldg., roads, heating plant, water supply sewage treatment plant, at McClellan Air Force Base. $20,000,000.

▲† **Ky., Fort Knox**—HOUSING and STORAGE FACILITIES—U. S. Eng., 830 W. Broadway, Louisville, Zone 3, troop housing, storage facilities, Godman Air Force Base. $1,145,000.

LATIN AMERICA

Cuba, Havana—Adolph A. Pfeffer, 2920 Ella Lee Lane, Houston, Tex., plant cattle-rice production project, incl. large amount of fencing, cattle barns, storage warehousing, cattle pens and allied facilities. 46,000-acre tract. $750,000.

▲ **Mexico, Balbuena**—Banco Nacional Hipotecario Urbano (National Urban Mortgage Bank), Madero 32, Mexico City, plans by Felix Sanchez B. c/o owner, model city for 42,000 persons. $5,000,000.

▲ **Mexico, Mexico City**—Felix Cervantes, Aquiles Serdan, 14 Mexico City, plans 6,000 seat amusement center. $2,000,000.

Mexico, Mexico City—National University, Mexico City, plans road building technicians school. $350,000.

▲ **Mexico, Rio Bravo**—Celulosa Nacional, S. A., Rio Bravo, Tampa, plans automobile tire canvas factory. $1,000,000.

▲ **Mexico, Tampico**—Nacional Financiera, etc., c/o Federal Bldg., Mexico City, plans cellulose plant. $5,500,000.

▲ **Mexico, Tepehuenas**—Nacional Financiera, etc., c/o Federal Bldg., Mexico City, plans newsprint plant. $11,500,000.

PUBLIC BUILDINGS

Calif., Compton—SCHOOL—Compton City School Dist., Compton, plans by H. L. Gogerty, 3123 W. 8 St., Los Angeles, administration bldg. and Lincoln School addns. $500,000. CD 11/1/50.

▲ **Calif., Inglewood**—SCHOOL—Inglewood City School Dist., Inglewood, voted $2,750,000 bonds, school facilities. CD 5/14.

Calif., Martinez—SCHOOL—Martinez and Alhambra Union High School Dist., Martinez, $410,000 bond election Sept. 30, for elementary schools and $494,000 for high school districts. CD 4/2.

Ill., **Harrisburg**—SCHOOLS—Harrisburg School Dist. Bd. Educ., Harrisburg, voted $480,000 bonds, enlarge, rehabilitate 4 grade schools and Junior High School Bldg., etc. $480,000. CD 3/27/50.

▲ **Ill., Villa Park**—SCHOOL—School District 88, Villa Park, York Community High School. $3,500,000.

† **Ind., Fort Benjamin Harrison**—SCHOOL—U. S. Eng., 520 Merchandise Mart, Chicago, 54, Ill., combined adjutant generals school and finance school. Allied Architects & Engineers of Indianapolis, Inc., 644 E. Maple St., Indianapolis, engr. and archt. CD 2/12/51.

▲† **Ky., Fort Knox**—HOSPITAL—Office of Surgeon General, Navy Dpt., 23 and E St., N.W., Wash., D. C., 9 story, hospital. $8,000,000. CD 10/1/51.

La., Opelousas—SCHOOL—St. Landry Parish School Bd., Opelousas, plans by Robert L. Stephan, 229 Dunreath St., Lafayette, Geo. Washington Carver Elementary-High School, Sunset, $400,000. CD 12/19/51.

Md., Towson—SCHOOL—Baltimore Co. Bd. Educ., Aigburth Rd., plans by Henry Powell Hopkins, 10 E. Mulberry St., Baltimore, 1 story, brick, concrete block, steel Villa Cresta Elementary School addn., Parkville, $525,000. Van Rensselaer Saxe, 1701 St. Paul St., Baltimore, struct. engr. Jas. Posey & Assoc., 10 E. Pleasant St., Baltimore, mech. engrs.

Mich., Ionia—SCHOOL—City, Bd. Educ., J. Clyde Spencer, plans by Roger Allen & Assoc., 1126 Grand Rapids National Bank, Grand Rapids, 2 story, bsmnt., brick, steel high school, $425,000.

Mich., Lapeer—HOSPITAL—Lapeer Co., Lapeer County General Hospital, Bd. Trustees, plans by Giffels & Vallet, 100 Marquette Bldg., Detroit, 1 story, bsmnt., brick, steel hospital, N. Main St. near Barry Dr., 6½ acre site. $400,000. CD 11/15/50.

Minn., Bemidji—SCHOOL—Bd. Educ., Independent School Dist. 7, Dr. A. C. Gilmer, clk., $550,000 bond issue was authorized May 28, grade school, Foss & Co., Moorhead, archts.

Minn., Bricelyn—SCHOOLS—Bd. Educ., Independent School Dist. 132, V. Thompson, clk., voted $565,000 bonds May 20, grade school, Haarstick, Lundgren & Assoc., W. 1385 First National Bank Bldg., St. Paul, archts. CD 5/21.

Minn., Evansville—SCHOOL—Bd. Educ., Lloyd Schwantz, clk., defeated $489,000 bonds May 27, school, $450,000.

▲† **Mo., Camp Crowder**—CAMP BUILDINGS—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., rehabilitation, constr. camp buildings, on 12,000 acre reservation for permanent army installation, $1,980,000.

Mo., Monett—FACTORY—Monett Chamber of Commerce, Monett, and Varsey-Bristol Shoe Co., 38 Scio St., Rochester, N. Y., brick, concrete, 15,000 sq. ft. shoe factory, on St. Louis-San Francisco R.R. tracks.

Mo., St. Louis—HOSPITAL—St. Louis State Hospital, 5300 Arsenal St., Zone 9, brick, rein.-con. laundry bldg. $450,000.

N. J., Fort Dix—SCHOOL—U. S. Housing & Home Finance Agency, 346 Broadway, New York, N. Y., plans by Alexander Merchant & Son, 1 Elm Row, New Brunswick, elementary school, $650,000.

Tex., Austin—SCHOOL—Austin Independent School Dist., Austin, plans by C. H. Page & Son, 305 W. 11 St., elementary school, E. 5 St. $400,000. CD 11/15/50.

Tex., Daingerfield—SCHOOLS—Daingerfield Independent School Dist., plans by Stanley Brown, 1851 Cedar Spring St., Dallas, elementary school addn., $300,000; Negro School, $325,000.

Tex., Deer Park—SCHOOLS—Deer Park Independent School Dist., c/o Clyde Abshier, supt., Deer Park, 16-classroom elementary school, $300,000; grade school, $325,000; school remodeling, addns., $350,000.

Tex., San Antonio—SCHOOL—Community Facilities Service of Housing & Home Finance Agency, 1016 Texas & Pacific Bldg., Fort Worth, plans by Harvey P. Smith & Assoc., 1204 Natl. Bank Commerce Bldg., elementary school for Lackland Air Force Base Independent School Dist. $300,000-$400,000. Halsey & Royer, Transit Tower, Charles Reynolds, Jr., Transit Tower, consult. engrs. CD 5/21.

Utah, Provo—SHOP WINGS—State Bldg. Bd., State Capitol, Salt Lake City, plans by Joseph Nelson & Sons, 1st Security Bank Bldg., construct 2 shop wings at Central Utah Vocational School. $400,000.

Wyo., Douglas—SCHOOL—High School Dist. Bd. and School Dist. 17, Douglas, Junior-Senior High School, $600,000.

▲ **Ont., Oshawa**—POST OFFICE—Dpt. P. Wks., Hunter Bldg., Ottawa, plans by E. A. Gardner, c/o owner, and Marani & Morris, 1250 Bay St., Toronto, 2 story, bsmnt., postoffice, Athol and Simcoe Sts. $3,000,000.

Sask., Prince Albert—HOSPITAL—Municipallty, City Hospital Bd., Prince Albert, 50-bed hospital, $500,000. CD 6/16/49.

COMMERCIAL BUILDINGS

Calif., San Francisco—PSYCHIATRIC—Sisters of Mercy, Hays and Stanyan Sts., plans by Frank T. Georgeson, 355 Stockton St., 4 story 40-bed psychiatric addn. to St. Mary's Hospital, Hayes and Stanyan Sts. $350,000.

▲ **Colo., Wheat Ridge**—SHOPPING CENTER, etc.—Leonard W. Tolleson, W. 44 and Wadsworth Aves., shopping center, supermarket, department store, variety store, drug store and other shops. $1,247,500.

Fla., Key West—APARTMENT UNITS—Harry Cohen, c/o Gerard Pitt, 1102 Congress Bldg., Miami, Fla., 57 apartment units, $400,000.

▲ **Ind., New Castle**—HOMES—Clifford Payne, New Castle, developing Payne Village, incl. 150 homes, sidewalks, sewers, water lines, etc. on 50 acre site, also a shopping center, $1,000,000 or more.

Md., Baltimore—SHOPPING CENTER—Uplands, Inc., 4625 Edmonson Ave., Baltimore, plans by Hal. A. Miller & Assoc., 2134 Maryland Ave., shopping center, icl. 3 story, brick, concrete, steel office, department store, stores, recreation facilities, parking areas, pedestrian tunnels to connect with existing shopping center on north side.

Mass., Lawrence—COMMUNITY CENTER, etc.—Temple Emanuel, 16 Cary Ave., plans by Kelly & Gruzen, archts. and Wm. Davies, assoc. archt., 73 Tremont St., Boston, community center and temple. $300,000. CD 11/15/51.

Mass., Worcester—ENGINEERING—Worcester Polytechnic Institute, Institute Rd., plans by Appleton & Stearns, 53 State St., Boston, 2 story, brick, limestone civil engineering bldg. $550,000. CD 4/11.

Mich., Dearborn—CHURCH—Cherry Hill United Presbyterian Church, 24110 Cherry Hill St., plans by Andrew R. Morison, 713 Fox Theater Bldg., Detroit, 1 story, bsmnt., brick, stone church. $300,000.

Mo., Glendale (St. Louis 19, P.O.)—CHURCH, etc.—Webster Grove Christian Church, Rev. R. F. McAllister, pastor, 712 Tuxedo Blvd., Webster Grove, Zone 19, plans by P. John Hoener, 4606 Beck Ave., St. Louis, Zone 16, church and chapel on 3 acre site, Berry Rd. and Lockwood Ave. $515,000.

▲ **Mo., Kansas City**—EXCHANGE—Southwestern Bell Telephone Co., c/o H. H. Mudd, div. mgr., 11 and Oak Sts., 2 story Liniwood-Wabash Exchange addn., 39 and Montgall Sts. $1,000,000. Max W. Newby, 1010 Pine St., St. Louis, consult. engr.

N. J., Trenton—SUPERMARKET—Owner, c/o Arthur N. Rogers, archt., 125 Morningside Dr., supermarket. $350,000.

O., Akron—EDUCATIONAL—Trinity Lutheran Church, Dr. Fred C. Wieghman, pastor, 54 N. Prospect St., 3 story educational unit. $300,000.

Pa., Phila.—OFFICE—Gulf Oil Corp., 30 St. and Penrose Ave., plans by Howell Lewis Shay, Packard Bldg., office alterations. $300,000.

Pa., Wilkensburg—SCHOOL—St. Bartholomews Roman Catholic Church, Wilkensburg, plans by Marlier & Johnstone, 1107 Empire Bldg., Pittsburgh, 2 story, 55x200 ft., brick, steel parochial school addn. and convent. $350,000.

Tenn., Knoxville—CHURCH—Fifth Ave. Baptist Church, Fifth Ave., church. $300,000.

Tex., Brownsville—SHOPPING CENTER—Dofman's & Assoc., Brownsville, plans by A. H. Woolridge, Anthony Bldg., 52,800 sq. ft., 17 masonry shopping center units. $375.000.

Tex., Dallas—DWELLINGS—Crow & Benda, 1152 N. Buckner St., 45 frame dwellings, asb. siding, concrete slab fdn., $325,000; 55 masonry frame, dwellings, concrete slab fdn., $400,000; to be known as "Dallas Peacemaker", both across way from East Ridge Park.

Tex., Dallas—DWELLINGS—Pelt Bros., 2727 W. Illinois St., plans by Charles E. Armstrong, 2202 Romine St., 35 dwellings, on an extens. of Mountain Lake Rd. $300,000.

▲ **Tex., Houston**—DWELLINGS—Brace & Carruth, 706 Garden Oaks St., plans by Herbert Caidwell, 4122 Glenbrook St., 35 frame, cedar shake dwellings, concrete slab fdn., $375,000; 40 frame, masonry trim dwellings, $337,500; 45 frame dwellings, $350,000; 44 cedar shake, frame, brick trim dwellings, $425,000 in extended sect. of Timber Grove Manor to be called "Wooded Wonderland".

▲ **Tex., Houston**—SHOPPING CENTER—Edgewood Corp., c/o Sterling P. Hogan, Sr., 3707 Buffalo Dr., shopping center on 15-acre tract in northwest sect. of Edgewood sub-division. $4,500,000.

Tex., Houston—DWELLINGS—Harold P. Hill, 8608 Park Terrace Blvd., plans by Jack Graham, 9929 Lucore St., 40 concrete slab, cedar shake dwellings, in Tanglewood subdivision and Afton Oaks, $310,000; plans by Matt Harwood, c/o owner, 38 frame bungalows concrete slab fdn. Loper St. in Oak Meadows, $300,000.

▲ **Tex., Houston**—DWELLINGS, etc.—Whipple Constr. Co., 2436 Bissonnet St., plans by Knostman & Webster, 2017 W. Gray St.; Job No. 2, 30 dwellings, $600,000; Job No. 3, 23 dwellings, $460,000; Job No. 4, 25 dwellings, $500,000; Job No. 5, 22 dwellings, $440,000; Job No. 6, 32 dwellings, $640,000; Job No. 7, 35 dwellings, $700,000; Job No. 8, 21 dwellings, $420,000; Job No. 9, 28 dwellings, $560,000; Job No. 10, 12 dwellings, $300,000; Job No. 11, 15 dwellings, $300,000; Job No. 12, 16 dwellings, $325,000; all foregoing on 575-acre tract, Westheimer Rd. across from Rivercrest Addn.; shopping center, off Westheimer Rd., $750,000. Hilton & Coulson, 3821 Fannin St., location engrs.

Tex., Kilgore—DORMITORY—Kilgore College, Kilgore, girls' dormitory. $300,000.

Tex., Longview—DWELLINGS—H. E. & S. Constr. Co., Longview, 55 addnl. dwellings, concrete slab fdn. $375,000; 45 addnl. dwellings, concrete slab fdn. $325,000; 60 addnl. dwellings, concrete slab fdn. $400,000; 40 addnl. dwellings, concrete slab fdn. $300,000.

Tex., Longview—COMMERCIAL—Thomas Bros., Glover-Crim Bldg., 100x40 ft., masonry commercial bldg., 128 E. Tyler St. $300,000.

Man., Winnipeg—STUDIOS—Canadian Broadcasting Corp., 1425 Dorchester St. W., Montreal, Que., constr. TV and radio studios, Portage Ave. and Yonge St. Approx. $870,000.

▲ **Ont., London**—Y.M.C.A. BLDG.—Young Men's Christian Assn., 429 Wellington St., plans by Sam Nock, National Y headquarters, 291 Broadway, New York, N. Y., U.S.A., 5 story, brick bldg. addns., alterations. $1,250,000.

INDUSTRIAL BUILDINGS

Ala., Roberta—PLANT—Southern Cement Co., Roberta, plant addns. $500,000.

Calif., Chula Vista—PLANT—Rohr Aircraft Corp., Chula Vista, plant addn. $450,000.

Del., Wilmington—DISTRIBUTION, etc.—General Baking Co., 420 Lexington Ave., New York, N. Y., plans by Cowell & Robinson, 25 W. 43 St., New York, N. Y., distribution bldg. and office. $225,000.

Fla., St. Petersburg—WAREHOUSE—9th Street Warehouse Co. c/o Joseph Messineo, Hall Bldg., warehouse, $125,000.

(Continued on page 152)

You can do more work per day—more days per year. When conversions and conventional trucks must stay home, you'll be on the job as usual. That's because...

this light-duty Model LD is a true 4x4!

Pays out on smooth highway, too! For general hauling or patrol work, the LD is a growing, economical favorite.

The LD licks a lot of snow and ice faster. Drivers like its easier, safer handling . . . its speed and maneuverability.

Here's one truck you can depend on to give you service, any time of the year. Whether it's at the start of the spring breakup, when rains keep heavier equipment in the garage, or after a winter snow-fall, you can always send an LD out on the job.

The LD is the only truck in the 14,500 g.v.w. work range that offers the full traction, safety and economy of *true, balanced* four wheel drive. Get the facts from your FWD distributor or THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wisconsin, and Kitchener, Ontario.

Built by the Makers of America's Foremost Heavy-Duty Trucks

You buy more than a truck when you buy an FWD

You get extra-traction and proper distribution of weight and power *Plus*:

- Ability to work more days per year
- Ability to handle more jobs
- Ability to travel easily and safely on or off the highway
- Ability to haul legal loads economically
- Lower maintenance costs (up to twice the front tire life, for example)
- Up to twice the truck life

World-Wide Sales and Service

(Continued from page 150)

Ga., Gainesville—PLANT ADDN.—City Ice Co., Gainesville, plant addn. $115,000.

▲ Ga., Rome—PLANT—General Electric Corp., c/o Robert & Co. Assocs., archts., 96 Poplar St. N.W., Atlanta, transformer mfg. plant, Approx. $3,000,000.

▲ Ind., Fort Wayne—PLANT—Cities Service Oil Co., Bartlesville, Okla., propane plant for bottling and storing propane gas; service station with restaurant and truck shop; gasoline storage plant and warehouse and offices for district on 6-acre tract on California Rd. near Fort Wayne Speedway. $3,000,000.

Mass., Natick—PLANT—Cott Bottling Co. of Boston, Inc., 69 Speen St., 1 story, 26x104 ft., brick, bottling plant addn., Speen St., $100,000. McCarthy Engineer Service, Main St., consult. engr. CD 4/18.

▲ Miss., Yazoo City—PLANT—National Chemical Co., subsidiary of Mississippi Chemical Co., Yazoo City, ammonia plant. $7,500,000. CD 2/7/50.

Mo., Independence—GARAGE—Moody Motor Co., 607 W. Lexington St., plans by Weatherford & DeFoe, 206 N. Liberty St., garage, $100,000.

N. Y., Brooklyn—MFG. and STORAGE—All Service Laundry Corp., 157 Ingraham St., Zone 6, 3 story mfg. and storage bldg., 59-63 Harrison Pl. $200,000. Edward F. Hammell, c/o owner, engr.

N. Y., Brooklyn—SHOP—Constel Realty Corp., 1511 Bushwick Ave., Zone 7, plans by Joseph Korwasky, c/o owner, 2 story auto repair shop, 89 Furman Ave. $135,000.

▲ N. Y., Potsdam—PLANTS—Niagara Mohawk Power Corp., 250 Park Ave., New York, Zone 17, hydroelectric generating plants at Five Falls on Raquette River near here, $4,000,000; at Blake Falls, on Raquette River, near here, $4,000,000; at Rainbow Falls on Raquette River, near here, $4,000,000; at Stark Falls, on Raquette River, near here, $4,000,000.

N. Y., Woodside—MANUFACTURING, etc.—Bragman & Diamondstein, c/o Frank Majer Jr., archt., 98-12, 66 Ave., Forest Hills, 2 story mfg. and office bldg., Northern Blvd. and 60 St. $120,000.

O., Columbus—WAREHOUSE—The Tracy-Wells Co., 127 N. Front St., plans by Tully & Hobbs, 582 Oak St., 2 story brick, concrete, steel bulk storage warehouse, at Lanewview. $250,000.

Pa., Johnstown—WAREHOUSE, etc.—Ward Trucking Corp., 200 7th Ave., Altoona, plans by George Pudeerbaugh, 1511 13th St., Altoona, 1 story, steel warehouse, loading and 40x50 ft. office, $200,000.

Okla., Bristow—PLANT—National Improvement Co., Commerce Exchange Bldg., Oklahoma City, wood charcoal plant. $100,000.

Tenn., Memphis—LABORATORY—Buckeye Cotton Oil Co., Sterick Bldg., plans by Walk C. Jones-Walk C. Jones, Jr., 1215 Poplar St., research and development laboratory. $100,000.

Tenn., Memphis—GARAGE—C. W. Nash, 695 Union St., plans by George Mahan, Jr., Medical Arts Bldg., auto storage garage. $200,000.

Tex., Conroe—PLANT—Columbian Carbon Co., Conroe, bag collector sys. in its carbon black plant. $500,000.

Tex., Houston—AUTO PARTS—Radal Corp., 1101 S. Akard St., Dallas, auto parts bldg. $300,000.

▲ Tex., Houston—PLANT—Houston Oil Field Materials Co., Inc., 1524 Maury St., integrated plant, near Industrial area. $1,500,000.

Wash., Seattle—PLANT—Northwest Nut & Bolt Co., 4222 8 Ave. N.W., 100x140 ft. rein.-con. nut and bolt mfg. plant. $100,000.

Alaska, Anchorage—STORAGE—Anchorage Cold Storage Co., Anchorage, 130x300 ft., steel frame cold storage bldg. $250,000.

Alta., Edmonton—PLANT—Great Western Garment Co. Ltd., 97 St. and 103 Ave., plans by W. Ralph Brownlee, 11535 Albert St., 280x300 ft. manufacturing plant. $400,000. CD 10/26.

Alta., Leduc—PLANT—Imperial Oil Ltd., 56 Church St., Toronto, Ont., gas conservation plant extension. $500,000.

Ont., Kitchener—PLANT—Dominion Electrohome Industries Ltd., 39 Edward St., reconstr. furniture and electronics plant. $750,000.

Ont., London—WAREHOUSE—General Motors of Canada, W. A. Wecker, pres., Oshawa, cement block warehouse, Oxford St. $800,000.

UNCLASSIFIED

Ala., Troy—GAS DISTRIBUTION SYSTEM—City, natural gas distr. sys. Approx. $200,000. J. W. Goodwin Eng. Co., 2111 7 St. S., Birmingham, consult. engr.

Ala., Union Springs—GAS DISTRIBUTION SYSTEM—City, natural gas distr. sys. Approx. $200,000. J. W. Goodwin Eng. Co., 2111 7 St. S., Birmingham, consult. engr.

Calif., Bakersfield—SWIMMING POOL—Fruitvalle School Dist., Fruitvalle, plans by Robert N. Eddy, 1700 19 St., Bakersfield, swimming pool and facilities bldg. $100,000.

Colorado—RURAL DISTRIBUTION LINES—Highline Electric Assn., Holoyke, 238 mi. rural distr. lines sys. imprvs. and completing previously approved construction, Phillips Co. $700,000. Flora Eng. Co., 1717 E. Colfax Ave., Denver, consult. engr. CD 5/31/50.

Indiana—PIPE LINES—Ohio Valley Gas Co., Winchester, constr. 6 in. pipe lines in Fayette and Ripley Counties into the city of Connorsville. $500,000.

▲ Louisiana—SUBMARINE GAS LINE—United Gas Pipeline Co., 1525 Fairfield Ave., Shreveport, 31 mi. 20 in. submarine gas line to connect gas reserves in Ship Shoal area off Louisiana coast with pipe line under constr. in Terrebonne Parish, near Houma, $4,255,800. CD 9/1/49.

Missouri—TRANSMISSION LINE—Missouri Public Service Co., Ralph J. Green, pres., Warrensburg, 32 mi. high voltage transmission line from Raytown to Pleasant Hill then to Harrisonville.

Pa., Pittsburgh—ADMINISTRATION BLDG.—Jefferson Memorial Park, Inc., 711 Penn Ave., plans by H. R. Watterson, 709 Renshaw Bldg., 2 and 3 story bsmnt., brick, block administration bldg., Pleasant Hills. $300,000.

† S. C., Charleston—WET STORAGE BASIN FACILITIES—Dpt. Navy, Officer in Charge of Construction, Box 365, Naval Base, Charleston, exten. wet storage basin facilities at Charleston Naval Shipyard. $152,000. CD 7/15/49.

Tennessee—RAILROAD TRACKS—Tennessee Central Railway Co., H. R. Manby, ch. engr., American Trust Bldg., Nashville, 7.5 mi. railroad tracks, Putnam Co. $622,800.

Tenn., Smyrna—GAS SYSTEM—City, natural gas sys. Approx. $250,000. Barnard & Burk, 1023 Nicholson Dr., Baton Rouge, La., consult. engrs.

▲ Texas—RURAL DISTRIBUTION LINES—Lyntegar Electric Co-operative, Tahoka, 152 mi. rural distr. lines, 52 mi. 69 KV transmission line and sys. imprvs., Lynn Co. $1,700,000. CD 12/15/48.

▲ Texas—GAS LINE—Wilcox-Trend Gathering System, Inc., c/o Harry W. Bass, Magnolia Bldg., Dallas, 157 mi. 14- to 16-in. gas main line from near San Diego to vicinity Provident City, Duval Co., $9,545,000; 60 mi. gas gathering lines from vicinity San Diego to vicinity of Cuero, $680,000; 2,200 h.p. compressor station, near Runge, $375,000. Robert L. Purvin, Reserve Loan Life Bldg., Dallas, consult. engr. CD 5/19.

Tex., Lubbock—SWIMMING POOLS—City, City Hall, rein.-con. swimming pool, incl. appurtenances, S. Lubbock and 23 Sts. $135,000; parks, playgrounds, $375,000; rein.-con. swimming pool, 23 and Quirt Sts. $115,000. Parkhill, Smith & Cooper, Gibson Bldg., 1414 Avenue "J", consult engrs. CD 10/6/50.

Virginia—RURAL DISTRIBUTION LINES—Northern Neck Electric Co-operative, Warsaw, 175 mi. rural distr. line and sys. imprvs., Lancaster Co. $370,000. CD 1/9/47.

▲ Alaska—RURAL DISTRIBUTION LINES—Chugach Electric Assn., Anchorage, 237 mi. rural distr. lines and street lighting systems in Mountain View and Spenard, $3,000,000. CD 3/16/50.

★ The WORLD'S LARGEST Building Job

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—qualified by experience for responsible field positions on the BILLION DOLLAR Savannah River Plant.

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this SIMPLICITY pays off for you

LONGER PUMP LIFE

MORE ECONOMICAL OPERATION

HIGHER SUSTAINED EFFICIENCY

The story behind the great performance of the Rex® Self-priming Centrifugal Pumps is *simplicity* itself. The fact is, Rex is the simplest self-priming centrifugal pump ever built. There are only 6 *basic* parts —the cover plate (1) — the adjustable air peeler (2) — the impeller (3) — the wearing plate (4) — the pump body (5) — and the leakproof seal (6).

For you, this extreme design simplicity has great advantages:

You get LONGER PUMP LIFE . . . fewer parts mean less wear.

You get ECONOMICAL OPERATION . . . fewer parts to maintain . . . all parts except stationary part of seal can be inspected, maintained or replaced without touching the engine. All this means less chance for trouble . . . far lower maintenance cost . . . more gallons of water pumped per gallon of fuel and per dollar of cost.

You get SUSTAINED EFFICIENCY . . . this pump is designed for quick, easy replacement of all wearing parts to restore new pump efficiency.

For all the facts see your Rex distributor or write for Bulletin 51-27. Chain Belt Company, 4633 W. Greenfield Ave., Milwaukee 1, Wis.

DON'T FORGET THESE OTHER IMPORTANT REX ADVANTAGES

High PORTABILITY

All parts EASILY ACCESSIBLE

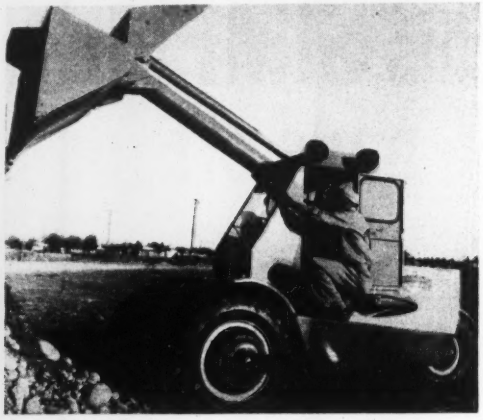
REPLACEABLE WEARING PLATE

PATENTED ADJUSTABLE AIR PEELER ***which means new pump priming efficiency for the lifetime of the pump.***

Combine them all with the basic Rex *design simplicity* with all parts readily accessible, and you have a pump that assures you years of low-cost, trouble-free service.

CHAIN BELT REX COMPANY ®

CONSTRUCTION MACHINERY . . .



Vest-pocket dozer supplements "one armed bandit" loader

Two complementary pieces of earthmoving equipment, both mounted on rubber tires, have been brought out by the Mixermobile Distributors.

At left above is the "Dozermobile," intended for both on- and off-highway use. Important features include a 4-wheel Vickers hydraulic drive and axle oscillation of as much as 24 inches. On pavement, the machine will go 15 mph, powered by a 140-hp gasoline engine; diesel power is optional. Dozer blade is 35x96 in. and can operate 9 in. below grade and 24 in. above. Self cleaning tires permit operation in mud.

Announced at almost the same time as the compact front-end loader shown at right, the "Dozermobile" is of course a separate piece of equipment, but can form an efficient earthmoving team with the loader.

• **Front-end loader**—The front-end loader, here being demonstrated to a new purchaser, is Mixermobile's Model H Scoopmobile, better known because of its design as the One Armed Bandit. This unique one arm is an 8¼-in. tubular member which is said to have double the bearing spread of ordinary two-arm loaders, and to be capable of taking more torque stress. It provides better visibility for the operator and makes possible an all-inclosed cab for his comfort and safety.

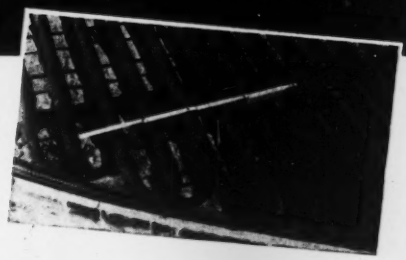
The eccentric arm-to-bucket connection has a high safety factor and has withstood continuous severe shocks under tests. Its entire design calls for a minimum of parts. One of the unique features of the Bandit is the stabilizer arm above the load arm; it keeps the bucket completely level during the entire cycle of operation. The hydraulic cylinder closes, loads and dumps the bucket with very little or no spillage. The tear-drop-shaped holes at the sides are both for ventilation and accessibility. Twelve years ago Mixermobile pioneered the development of a front-end loader and have become increasingly aware, during the past few years, of the specialized jobs to which they can be adapted. Calling upon the wealth of experience gained in development of the various Scoopmobile models, the design and engineering department, headed by Elmer Wagner, culminated their planning, designing and development in the One Armed Bandit. Among its other features are: three-to-one reduction planetary drive, reversing transmission with four speeds forward and reverse, Vickers hydraulic power steering and high ground clearance. The lift-arm is mounted on steel bushings with a 3¼-in hardened, ground mounting shaft. Foundation for this lift-arm hinge point is constructed of ½-in. plate on the chassis side and ⅜-in. plate on the outer side, all welded together to form an unyielding support.

The unit has a loading ability of 80 cu yd per hr, according to the manufacturer, and is equipped with a ¾-yd bucket. It's powered by a Chrysler Industrial 6-cylinder Model 8-114, 114 bhp engine. Rated lifting capacity is 4,000 lb, standard dumping height is 8 ft. Quickchange attachments include swivel-type concrete hopper, crane boom and lift forks. MIXERMOBILE DISTRIBUTORS, DEPT R, PORTLAND 20, OREGON.

Improved rubber developed for road mixes

The Goodyear Tire & Rubber Company recently announced development of an entirely new synthetic rubber powder for use in road construction. The new product is a finely-divided, free-flowing powder developed in cooperation with the Berry Asphalt Company of Magnolia, Ark., one of the nation's leading producers of asphalt road building materials. As a free-flowing powder the new rubber is easy to handle, and mixes freely with asphalt, unlike other types of rubber which display resistance to rapid dispersion. Test installations placed in the Middle West are being studied by research experts of both companies, as well as by highway construction engineers.

Independent testing laboratory reports show that from 1.5 to 2% of this rubber added to an asphalt mix is as effective as a 5% conventional rubber-asphalt mixture in resisting the stripping action of water and frost. The new rubber is reported to show considerable promise as a filler.—GOODYEAR TIRE & RUBBER CO., AKRON, OHIO.



16 MILES OF BYERS WROUGHT IRON PIPE SAFEGUARDS WOLLMAN MEMORIAL SKATING RINK

In Wollman Memorial Rink, world's largest outdoor artificial skating rink, more than 80,000 feet of 1¼ inch Byers Wrought Iron pipe, laid 4" center to center, were embedded in a 28,000 sq. ft. expanse of monolithic concrete skating area. The refrigeration system includes three York 11½" x 10" vertical, single acting two cylinder compressors, capable of producing a total of 300 tons of refrigeration. The rink, designed in accordance with the Carpenter Patents, operates from October to April.

Architect on the project was Amar Embury II. George B. Post & Sons were consulting engineers for the rink and Sears and Kopf were engineering consultants for the mechanical and electrical work. The American Carbonic Engineering Company was awarded the refrigeration contract. All work was done under the supervision of the city's Department of Parks, Robert Moses, Commissioner.

Genuine wrought iron pipe has proved its superior durability, over and over again, in rinks throughout the country. Its excellent forming and welding properties, and its established high resistance to corrosion are responsible for this widespread acceptance.

Our bulletin, WROUGHT IRON IN REFRIGERATION AND AIR CONDITIONING SYSTEMS, illustrates and describes several installations. Write for your copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N. Y.

Why Genuine Wrought Iron Lasts

This notch-fracture test specimen illustrates the unique fibrous structure of genuine wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

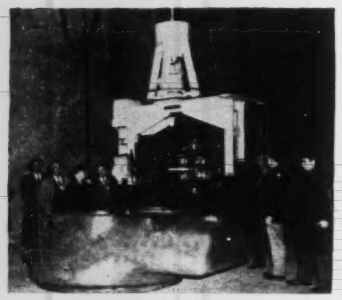
BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

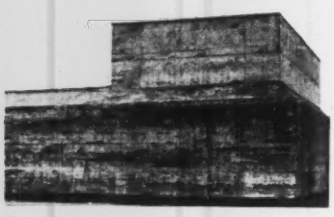
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS



This Betatron is an extra powerful x-ray camera capable of generating 24,000,000 electron volts.

GIANT X-RAY MACHINE

supported by Koppers Pressure-Creosoted Piles



This 4,000-ton concrete Betatron Building is supported by Koppers Pressure-Creosoted Foundation Piles.

ONE of the two largest industrial Betatrons in the world is installed at the Eddystone Plant of General Steel Castings Company. It was built by the U. S. Army Corps of Engineers, Philadelphia District. This powerful 24,000,000-volt x-ray machine is used to inspect heavy steel castings for U. S. Army tanks.

Personnel is protected from dangerous radiation by solid concrete walls 6-feet thick. To support the 4,000-ton Betatron Building and provide the absolute stability required, Koppers Pressure-Creosoted Foundation Piles were used.

Koppers Pressure-Creosoted Piles provide *lasting* protection—and they *cost less* than other permanent pile materials. For more information on Koppers Pressure-Creosoted Piles, write to Koppers Company, Inc., Pittsburgh 19, Pa.

KOPPERS COMPANY, INC., Pittsburgh 19, Pa.

KOPPERS PRESSURE-TREATED WOOD

NEW PRODUCTS

New ditcher has hydraulic control

The operator of this Runabout ditcher is just about to flip a fingertip control to stop the forward motion of the rig as the vertical bucket line approaches the concrete sidewalk. Other levers will quickly stop the bucket line and reversible belt. Then the ditcher can be driven away at a speed up to 15 mph after the boom has been hoisted.

Labeled Model 705-A, it has "Hydracrowd" hydraulic transmission that provides an infinite number of forward speeds from zero to 16 fpm, independent of bucket line speeds. An overload release sprocket trips when severe obstructions are encountered and automatically re-sets itself when cleared. When it meets such an obstruction, the ditcher can be backed away at top speed by lifting the hydraulic reverse lever. The operator can sit in his seat, as shown here, or operate the controls while standing on the ground. It has a two-man cab for travel with all conventional automotive controls and also features a follow-up scraper, headlights, double taillights and fenders on all wheels.

Digging range goes to 4 ft in depth and to 10½ in in width. A larger crawler-mounted version can dig to 8 ft 3 in and in widths up to 24 in. BARBER-GREENE COMPANY, AURORA, ILLINOIS.

Kolman introduces larger vibrating screens

Kolman screens, now widely used for portable loading and screening units, include single and double-deck models from 2x4½ ft to 3x6 ft sizes. Now the line has been expanded to include a larger variety of single, double and triple-deck screens. The Series "C" includes multiple deck units 3 and 4 ft wide and ranging to 8 and 10 ft lengths. Also added is a larger single deck model, 42 in. wide and available in either 6½ or 7 ft lengths, which is designed for use with large bucket loaders, 30-in. belt portable conveyors and similar jobs.

The Kolman spring design allows full freedom of vibrating movement and absorbs vibrations so they are not transmitted to attached equipment. Heavy duty springs and bearings are used for long service and paraboloic design of decks utilizes all space for maximum capacities. KOLMAN MANUFACTURING COMPANY, 5566 W. 12TH ST., SIOUX FALLS, S. DAK.

Stubby truck tractors for long trailers

In response to demands of truck operators for a conventional-type truck tractor capable of hauling 35 ft semi-trailers in states where 45 ft is the overall length limit, the motor truck division of International Harvester Company has introduced the "102 Space Saver". With 102-in. bumper-to-back-of-cab dimension, it offers truck operators the length-saving advantages of cab-forward or cab-over-engine truck tractors at less cost and retains the driver comfort, styling, and advantages of conventional trucks, states a company representative.

Thirty-five-ft trailers now can be pulled by conventional-type tractors in all states except Pennsylvania and Massachusetts, both of which restrict trailers to 33 ft regardless of overall length. All other states will permit either larger semi-trailer or greater overall length. INTERNATIONAL HARVESTER COMPANY, 180 NORTH MICHIGAN AVE., CHICAGO 1, ILL.

Gardner-Denver announces new 600-foot portable

A new 600 cu ft portable air compressor has been added to the Gardner-Denver line. It is mounted on a rugged undercarriage, said to provide the stamina required for moving the rig over rough terrain on construction projects. With the engine selected to provide reserve power at moderate operating speeds, the compressor is an 8x6½x6, operates at 1200 rpm and is designed with large valve areas, large radius air passages and carefully engineered ratio of low pressure to high pressure cylinders—features which are said to provide the rated 600 cu ft capacity with good compression efficiency. Like other G-D portables, the new 600 is a two-stage machine with water-cooled compressor cylinders. GARDNER-DENVER COMPANY, QUINCY, ILL.

New product briefs . . .

For exhausting dangerous or obnoxious fumes, dirt, heat and smoke and other applications where it is desirable to have the motor outside the air stream, **Standard Electric Mfg. Co. Inc., West Berlin, N. J.,** has brought out a **general-purpose type fan.** Features include sealed SKF bearings, adjustable motor base for belt takeup and heavy cast aluminum fan blade ranging from 18″ to 42″.

A new **checker-board-patterned hardwood plywood panel** is currently being offered by **U. S. Plywood Corp., 55 West 44th Street, New York 18, N. Y.** The new checkerboard plywood is available in 49 x 96-in. panels of five-ply construction.

Newest addition to the famous Lufkin family of **"Red End" rules** is the X-46F, an extension type made for inside, outside, regular, and flat reading measurements. Its boxwood finish is protected by a tough plastic coat. Both sides of the rule are graduated. Available from the **Lufkin Rule Co., Saginaw, Mich.,** it is marked consecutive inches to 16th and folded length is 8 in.

A **color system** has been devised by the **Wilbur & Williams Co., 130 Lincoln Street, Boston 35, Mass.** in their **Odorless Dampcoat Enamel** enabling painting over damp surfaces as well as dry. The chief feature of this color system is that it eliminates any tinting tube or agitant, and merely calls for easy mixing.

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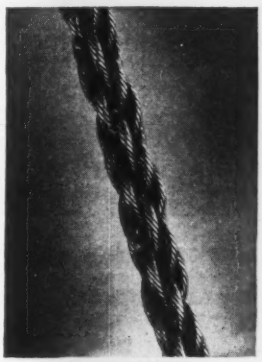

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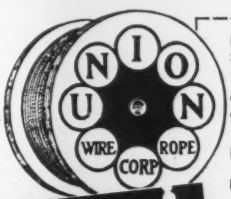

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PUBLICATIONS

Vermiculite concrete floors — New specifications for vermiculite concrete floors are now available in a 12-page booklet which presents concise data on the new vermiculite-sand concrete as a fill over structural floors, as a floor slab over supports on relatively close spacing and as a slab laid on the ground. Also included are specifications for vermiculite concrete floors on ground that is topped with sand concrete. VERMICULITE INSTITUTE, 208 S. LASALLE ST., CHICAGO, ILL.

Conveying equipment—For the cement and rock products industries, this new 42-page bulletin offers useful information on drive and conveying chains and bulk handling equipment. Complete details and specifications of all chains used in this industry are given in addition to cutaway and diagramatic views of the chain. Basic types of bucket elevators are illustrated and described with correct applications noted. Several pages on sprockets and traction wheels explain the right type for each application. BULLETIN 52-53, CHAIN BELT CO., DEPT. PR, MILWAUKEE 1, WIS.

Water conditioning data-book—A new enlarged edition of the Permutit data book brings up-to-date and revised tables—77 in number—to aid the engineer. The 116-page leatherette bound volume covers a variety of subjects—among them hydraulics, impurities in water, chemical conversions, saturated steam, boiler feedwater makeup requirements, chemicals used in water treatment, alkalinity relationships, specific gravities and chemical reactions. THE PERMUTIT COMPANY, 330 WEST 42ND ST., NEW YORK 36, N. Y.

Corrosite—Characteristics, applications and methods of use of corrosion resistant protective plastic paint are listed in an 8-page bulletin. In addition, uses in a variety of industries are outlined and systems for painting are explained. THE CORROSITE CORP., CHRYSLER BLDG., 405 LEXINGTON AVE., NEW YORK 17, N. Y.

How to clear rights-of-way—Providing latest information on chemical brush control, this 4-page brochure lists what chemicals to use, recommended dilution and methods of operation for both foliage spray and basal bark treatment. Mixing proportions are given in a table on the final page of the brochure available from THOMPSON CHEMICALS CORP., ST. LOUIS 3, MO.

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Needed—A new look at toll roads

No ENGINEER can look at the map of toll highways built or planned that is published on p. 23 of this issue without realizing how fast such highways are becoming a factor in the nation's highway-transport system. No longer can toll roads be looked on as isolated solutions for special problems having little national significance. Within three years' time there will be a continuous toll highway system from New York City across New Jersey, Pennsylvania and Ohio to the Indiana line, and probably another from Boston across Massachusetts and northern New York to the Ohio line. And there is in the making a north-south system, for which the West Virginia Turnpike forms the nucleus.

Two factors give these developments national significance and point to the urgent need for a reappraisal of state and national policies toward toll highways. One is the fact that these systems have taken form without any overall planning. The second is the high cost, not alone in dollars—which will soon be in the neighborhood of two billion—but in operating charges and interest on investment.

THE LACK OF PLANNING to make sure that each toll highway fits into the highway needs of a whole region is evident in the map on p. 23. In large measure that lack is due to the speed with which toll highways have become an important element in highway development of the eastern part of this country. But it also is due in part to the long-standing opposition of the Bureau of Public Roads and of most state highway departments to toll roads. That opposition was amply justified, because a free road with the same physical characteristics can provide better service at less cost. Yet if the conditions that have forced the present resort to toll financing could have been foreseen and accepted as inevitable at the end of World War II, the loss of transport efficiency resulting from the lack of integrated planning could have been reduced materially.

Similarly, an earlier recognition of the extent to which toll financing would be adopted, once public acceptance of toll roads had been demonstrated, would have saved a large part of the money that now must be paid out in bond interest over the next 20 or more years.

WHEN THE AMOUNT INVESTED in toll highways was small, the relatively high cost of the money borrowed on revenue bonds to finance them was of no national importance. But now that the investment in toll roads built or authorized is in excess of two billion dollars, the high cost of not having put the "faith and credit" of a state behind most of the bonds issued to build those roads takes on new significance.

For lack of such support, most of the turnpike commissions or authorities are paying interest rates about one percent higher than would be paid if state credit had been placed behind them. One percent on two billion dollars over the life of the bonds would build a lot of highways.

Revenue bonds issued to build the Maine Turnpike were sold with interest rates of 2.50 and 2.75%. Bonds issued by New Hampshire, with full state credit behind them, to provide a continuation of the Maine Turnpike to the Massachusetts line, were sold with an interest rate of 1.6%. Revenue bonds just sold by the Ohio Turnpike Commission carry a rate of 3.25%. New York State, where full state credit will be back of the Thruway Authority bonds, expects to finance its thruway at an interest cost around 2%.

THERE WERE SOUND REASONS behind the early decisions to require that bonds issued to build toll highways be revenue bonds. That requirement served as a check on unsound toll-road projects. Also, in many states, constitutional limits decreed it. But now that the need for major trunk highways has become so pressing that great states like New Jersey, New York and Ohio find that their road needs can be met only by toll highways costing from a third to a half a billion dollars, the step taken by the voters of New York State last year to put state credit behind the thruway bonds seems to be the only logical one.

IT IS TOO LATE to avoid payment of high interest rates on most of the bonds already issued, but there are ways in which the total amount of the payments can be reduced, and there are unexplored ways for cutting the total cost of toll highways. It is too late to correct all the errors that have been made in laying out toll highways without due regard to regional highway needs. Some, however, can be corrected and others can be avoided if integrated planning is started soon.

One way in which the total amount paid in interest can be reduced would be through allocation of part of a state's gasoline-tax income to the toll highways in any state for the payment of policing costs, as has been proposed by Thomas J. Evans, head of the Pennsylvania Turnpike Commission. That would release more income for bond retirement, thus speeding the date when the turnpikes can be made toll free.

Another way would be to authorize the use of some federal-aid money—possibly less than the amount used on free roads—to pay part of the cost of future toll highways. Obviously, good arguments for and against both these proposals can be made. Nevertheless, both should be fully explored in any new study of national policy toward toll highways.

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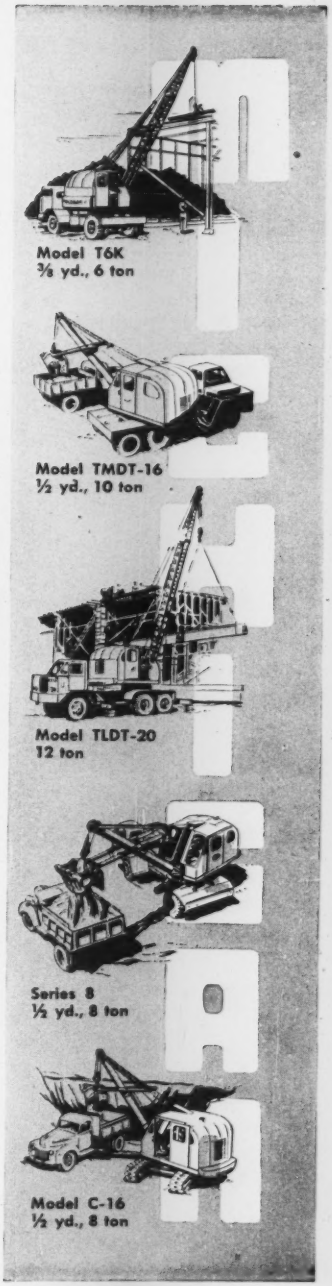
Other contractors figured on the necessity of using a large crane with long boom to reach from outside a building being erected. Gurtzweiler, taking advantage of his MICHIGAN'S compact size and maneuverability, planned to work from a central point *inside* the building. Result? Henry Gurtzweiler, Inc. got the job . . . another of the many on which the MICHIGAN has given them a competitive advantage.

Moreover, Mr. Gurtzweiler states that although the truck crane is five years old and never has had an idle day, it is still in perfect condition and has had very little maintenance. Why settle for less? Next time you need a truck crane . . . get a MICHIGAN!



Model T6K
⅜ yd., 6 ton

Model TMDT-16
½ yd., 10 ton

Model TLDT-20
12 ton

Series 8
½ yd., 8 ton

Model C-16
½ yd., 8 ton

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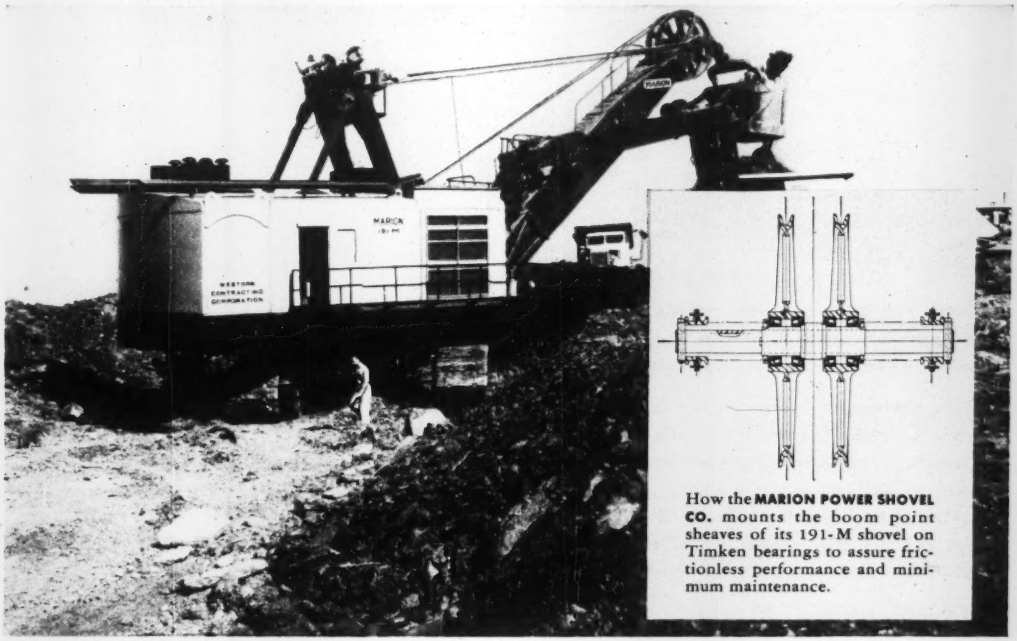

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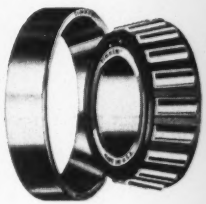

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